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IMPLICATIONS OF POPULATION GROWTH IN AUSTRALIAN CITIES: CASE STUDY - TOWNSVILLE, QLD

2012

ABOUT THE AUTHORS

The Institute for Sustainable Futures (ISF) was established by the University of Technology, Sydney in 1996 to work with industry, government and the community to develop sustainable futures through research and consultancy. Our mission is to create change toward sustainable futures that protect and enhance the environment, human well-being and social equity. We seek to adopt an inter-disciplinary approach to our work and engage our partner organisations in a collaborative process that emphasises strategic decision-making.

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Case study summary

Townsville is located approximately 1,300 kilometres north of Brisbane and 350 kilometres south of Cairns. With a 2011 population of 180,389, Townsville is the fourth-largest metropolis in Queensland and the largest urban area outside South East Queensland. The city is a major commercial, service and administrative centre for North Queensland, and a focus of the North Queensland regional economy. The city has been identified by the federal government's Regional Development Australia (RDA) Committee for Townsville and North West Queensland as a potential 'second capital' for Queensland, a role that Townsville City Council endorses.

In the past decade Townsville has experienced rapid population growth, growing at an average annual rate of 2.2 per cent. This growth is forecast to continue, with the city's population predicted to rise to between 263,870 and 325,929 by 2031. This projected rate of growth is the fourth-highest of Australia's 20 largest urban centres, and suggests that Townsville will soon move past Geelong to become Australia's 12th-largest city.

Townsville has a younger population than the Australian and Queensland averages because, like most major economic centres, the population age profile is skewed towards those of working age. The city has traditionally experienced a high turnover of people, with the large defence force base, government services, and more recently the mining industry bringing in many short to medium-term working age residents. The higher than average concentration of younger people may also be attributable to the presence of several post-secondary educational and training facilities in Townsville, including James Cook University.

The data analysis conducted for this case study suggests a number of implications of recent and future population growth in Townsville.

While local level environmental data is limited, it appears that population growth, and the associated increase in the number of dwellings in the area, is contributing to urban sprawl, a pattern of development that creates a range of environmental problems. The increase in hard surfaces exacerbates water run-off problems, and new housing is typically not well-designed for the local climate, which makes it more likely to be relatively inefficient in terms of energy use. Further, this kind of low density suburban development, combined with very poor public transport infrastructure, means that Townsville is a highly car dependent city.

The social indicators show that Townsville is a relatively advantaged area. This is reflected in health data, which suggests that Townsville residents have better health status than Queenslanders in general. Educational attainment data is also consistent with the relatively advantaged nature of the area, with Townsville having significantly higher rates of bachelor's degree or higher qualifications compared to North Queensland and Queensland as a whole. Unemployment is slightly lower than the Australian average, and a full percentage point lower than the Queensland average.

Townsville has a strong and unusually diverse regional economy. Standards of living are relatively high and rates of mortgage stress are lower than those in North Queensland or Queensland as a whole. Rates of rental stress are slightly higher than in the broader North Queensland region, but lower than the state average.

Stakeholders interviewed for this case study pointed to a number of positive impacts of population growth, suggesting that it is helping to bring more 'city-like' amenities to Townsville, supporting a greater range of health and education services, and continuing to boost the local economy.

However, many stakeholders felt strongly that the 'urban sprawl' character of local development had a number of significant downsides, and while most were supportive of future growth, they were keen for future development to be better planned and coordinated. In particular there was a feeling that residential development needed to be better integrated with services and infrastructure (particularly public transport), better suited to the North Queensland climate, and more diverse in terms of housing type – including the provision of more infill, or higher density residential development in the inner part of the city.

Stakeholders were generally positive about the recent council amalgamation, suggesting that this had increased the capacity of the city to take a more effective and strategic approach to the planning of future growth and development. A number noted, however, that there remain significant concerns about how the costs of future infrastructure needs will be met – again, particularly if the current pattern of low density, spread-out development were to continue.

Glossary

ABS	Australian Bureau of Statistics
AIMS	Australian Institute of Marine Science
CBD	Central Business District
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities
EPBC Act	Environmental Protection and Biodiversity Conservation Act (Cth)
FIFO	Fly-in-fly-out
GBRMPA	Great Barrier Reef Marine Park Authority
GDP	Gross Domestic Product
GRP	Gross Regional Product
ha	hectares
IRSD	Index of Relative Socio-economic Disadvantage (a SEIFA index)
ISF	Institute for Sustainable Futures
LGA	Local government area
NBN	National Broadband Network
NIEIR	National Institute of Economic and Industry Research
NEPM	National Environment Protection Measure
OESR	Queensland Office of Economic and Statistical Research
QCOSS	Queensland Council of Social Service
QLD	Queensland
RDA	Regional Development Australia
SEIFA	Socio-Economic Indexes of Areas
SoE	State of the Environment report
SoR	State of the Regions
ULDA	Urban Land Development Authority
UTS	University of Technology, Sydney

Contents

Background and context

Geography and features

Townsville is a city on the north-eastern coast of Queensland, Australia. It is located approximately 1,300 kilometres north of Brisbane and 350 kilometres south of Cairns. The City of Townsville local government area (LGA) covers 3,736 square kilometres (0.2% of the total area of the State of Queensland), and is the 18th-largest LGA in Australia. With a 2011 population of 180,389, Townsville is the fourth-largest metropolis in Queensland (after Brisbane, the Gold Coast and the Sunshine Coast) and the largest urban area outside South-East Queensland. The city is a major commercial, service and administrative centre for North Queensland, and a focus of the North Queensland regional economy.

The Townsville LGA encompasses the cities of Townsville and Thuringowa (amalgamated in 2008), together with the surrounding rural areas (see Figure 1). To the south are the communities of Alligator Creek, Woodstock and Reid River, and to the north the Northern Beaches, Paluma and Magnetic Island.

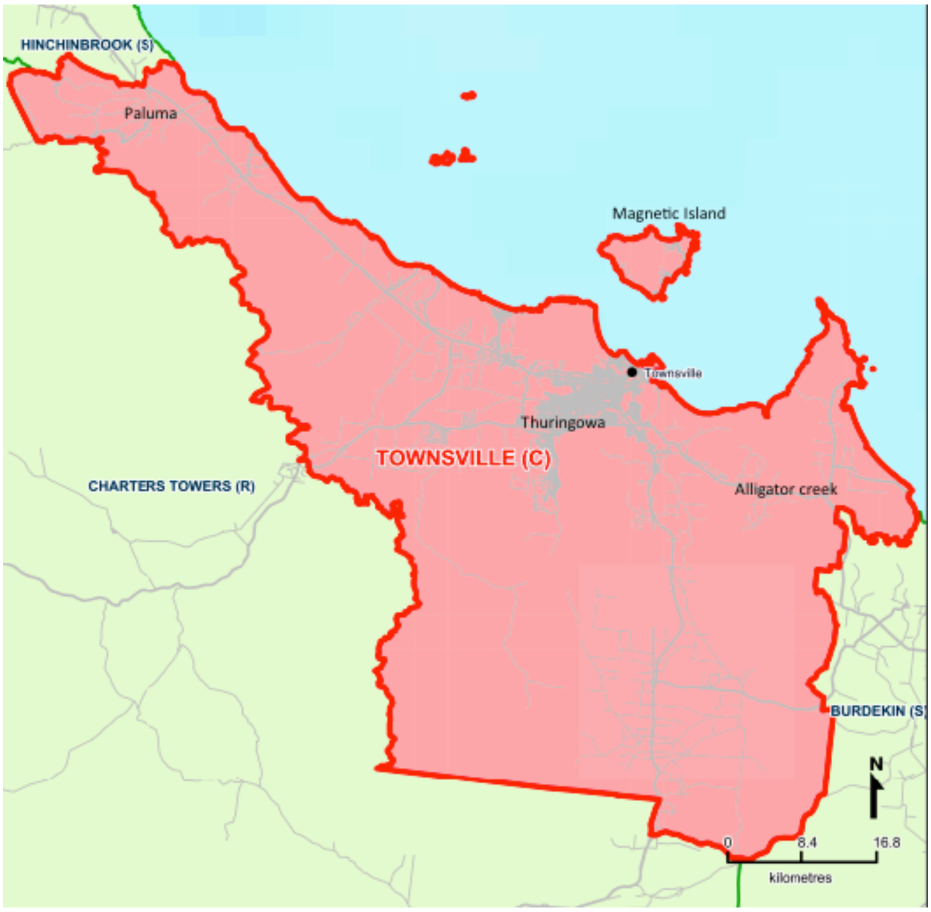

Figure 1: Map of Townsville LGA (Source: OESR, 2012)

Townsville is located in the Burdekin Dry Tropics Region and has a dry tropical climate. The region is characterised by diverse landforms and natural environments, including rivers, creeks and freshwater wetlands, hills and mountains and a long coastline featuring beaches, mangrove estuaries, saltpans and coastal swamps. These natural habitats support a wide range of flora and fauna and a number of endangered, vulnerable and rare species. National Parks and other reserves in the area include Magnetic Island, Paluma Range and Bowling Green Bay National Parks; and the Cape Pallarenda and Townsville Town Common Conservation Parks. Parts of the region are within the Great Barrier Reef World Heritage Area, the Great Barrier Reef Marine Park and the Queensland State Marine Park.

European settlement of Townsville began in 1864 and it developed into a port and transport centre for local agricultural industries. During World War II, the town became a garrison base for the war in the Pacific. Townsville remains a strategically important defence centre today, with the largest defence establishment in Australia located at Lavarack Barracks. Townsville Port also continues to play a crucial part in the local economy. Townsville airport provides a regional transport hub for North Queensland, and services 1.6 million passengers annually. Passenger numbers have grown in recent years, primarily due to the increase in fly-in fly-out (FIFO)[1] arrangements (Townsville Enterprise, 2012c: 20).

The federal government's Regional Development Australia (RDA) Committee for Townsville and North West Queensland has identified Townsville as a potential 'second capital' for Queensland (RDA, 2011: 5). Townsville City Council endorses this role for Townsville as a city that could provide a solution to the congestion and population pressures faced by South East Queensland (Townsville City Council, 2010c). The federal government has also praised Townsville as a model of regional development:

> *'Townsville is an example of what can be achieved in a regional centre. Townsville has a diversified economy, good infrastructure and is reaping the rewards through economic growth and jobs creation'* (Simon Crean MP, Minister for Regional Development, cited in Townsville City Council, 2010c).

Figure 2: Geographical context map of Townsville

The area covered by the Townsville LGA is 3,736 square kilometres and includes the land tenures outlined in Table 1

[1] Fly-in fly-out (or FIFO) is a method of employing people in remote areas. Employees live in another location and are flown to the remote area to work. They typically work on a roster for a number of days, before flying home for a number of days' rest. This arrangement is common in the mining industry.

Table 1. Private tenure is the largest use of land within the Townsville LGA, covering approximately 63.8% of the area, with the next-largest being National Parks which account for approximately 18.8% of land use (C&R Consulting, 2010).

Table 1: Land tenures in Townsville LGA (Source: C&R Consulting, 2010)

Land manager	Approximate area (hectares)	% of total Townsville LGA area
Federal land	8,378	2.25%
National Park	69,897	18.8%
Private	237,340	63.8%
State land	27,475	7.4%
State reserve	24,090	6.5%
All other	5,049.6	1.4%

Population summary

The estimated population of Townsville City at 30 June 2011 was 180,389 persons, with 174,462 residents counted in the 2011 Census. In the past decade, Townsville has experienced rapid population growth. Between 2000 and 2005 the average annual population growth in Townsville was 2.5%, compared with 2.2% for Queensland overall. In 2005–06, the Townsville Statistical District grew by just over 3 per cent, making it the fifth-fastest growing district or division in Australia. Natural increase accounted for the addition of 1,991 persons over the year, compared with assumed net migration which accounted for the addition of 1,689 persons.

The high population growth recently experienced by Townsville is forecast to continue, with the city's population predicted to rise to between 263,870 and 325,929 people by 2031 (Townsville City Council, 2010a). This projected rate of growth is the fourth-highest of Australia's 20 largest urban centres, and will see Townsville move past Geelong to become Australia's 12th-largest city (KPMG, 2010: 9).

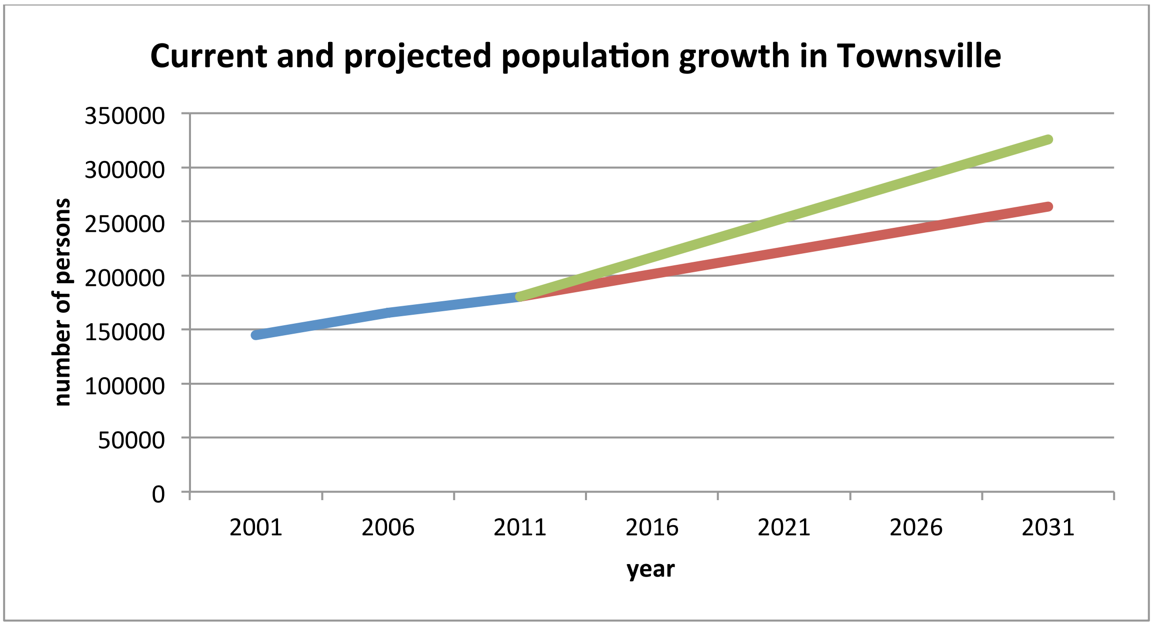

Figure 3: Current (blue) and projected (red – low, green - high) population growth in Townsville (Source: Townsville City Council, 2010a; ABS, 2012a).

Table 2: Context indicator – population (Source: ABS, 2012b)

	Townsville 2001	Townsville 2011	Northern Queensland 2011	QLD 2011
Population (persons)	144,789	180,389	223,968	4,474,098
Rate of growth 2001-2011 pa		2.2%	1.7%	2.1%
Population density (people/km^2)	38.8	48.4	2.8	2.6

Factors contributing to growth

Townsville's initial growth was influenced by a number of major projects and developments during the last century, including the commencement of mining in the region, the establishment of an army and air force presence, and the opening of James Cook University. Specific projects that are thought to have influenced the growth of Townsville in the past decade include: the redevelopment of 'the Strand' foreshore, the construction of a new public hospital, the adoption of an irrigation strategy to enable the greening of public space, the redevelopment of Lavarack Barracks, expansion of the mining industry FIFO workforce, and the emergence of Palmer Street as an accommodation and hospitality precinct close to the city centre (Townsville Futures Task Force, 2011: 11).

Government investment in the region has helped to drive much of this growth, with the $30 million redevelopment of the Strand and the establishment of the SunMetals zinc refinery referred to as key 'catalyst projects' that helped to rapidly grow the population, with ongoing investment in the Port of Townsville also significant (Townsville Futures Task Force, 2011: 12).

A particularly important factor that has contributed to the growth of Townsville in the past and will continue to drive future growth is its status as a 'focal hub' – a city that connects many other parts of North Queensland. It plays this role in both an economic and social sense. Business and industry in the region rely on the services and facilities provided by Townsville, and the city also provides an important home base for people travelling to work in other areas of North Queensland. Townsville's geographical location makes it 'the natural value-adding and distribution point for the region', and the port facilities, and high-capacity rail and road systems connect the city to the wider region and to global export and import markets (Townsville Futures Taskforce, 2011: 22). Many government and administrative functions for North Queensland are also located in the city. As the Townsville Futures Taskforce (2011) points out, it is widely recognised that Townsville's strengths are based on these various connections within and beyond the region.

Urban development

Historically, residential development in Townsville has been suburban, or sprawling in nature, with the growth of suburbs on former rural land to the north, south and west of the city. The southern suburbs of Idalia and Oonoonba, which have been particular hot spots of growth, reportedly grew by 171.7% in the 10 years to 2011. Douglas, adjacent to James Cook University, Deeragun to the north and Bohle Plains to the west all more than doubled in population in this period (Galloway, 2012). These are all outer suburbs of Townsville, indicating that growth has been characterised by a high degree of urban sprawl.

At the same time however, there has also been an increase in higher density residential development in the inner city, where the population has doubled since 2001 (KPMG, 2010: 12-13). High rise development in general has dramatically increased in the central business district (CBD) in recent years, with the development of many high rise commercial and residential buildings rapidly changing the city skyline.

While growth in the inner city is predicted to continue, much of the future growth will be in suburban areas to the west and north. This includes, for example, North Shore estate, a master-planned development currently under construction approximately 12 kilometres north of the CBD. North Shore estate will provide homes for approximately 15,000 new residents in the next 15 years. Another major master-planned development scheduled for delivery between 2012 and 2047 is Rocky Springs. Located on a 1,594-hectare site, approximately 15 kilometres south east of the CBD, Rocky Springs will be Townsville's largest master-planned community with 12,000–15,000 dwellings expected to provide homes for 35,000–38,000 new residents.

Social characteristics

Age profile

The median age of Townsville residents is 33.2 years, a figure that has increased by 0.4 years over the five-year period from 30 June 2006 to 30 June 2011. This is lower than the median age of people in Queensland as a whole, which is 36.6 years and has increased by 0.6 years over the same period. As at June 2011, 20.7% of persons in Townsville were aged 0 to 14 years, 69.7% were aged 15 to 64 years and 9.7% were aged 65 years and over.

Townsville has a younger population than the Australian and Queensland averages because, like most major economic centres, the population age profile is skewed towards those of working age. The city has traditionally experienced a high turnover of people, with the army base, government services, and more recently the mining industry bringing in many short to medium-term working age residents. The higher than average concentration of younger people may also be attributable to the presence of several post-secondary educational and training facilities in Townsville, including James Cook University, the Barrier Reef Institute of TAFE and Tec-NQ.

The most common family type in the area is couple family with children (43.5%), followed closely by couple family with no children (37.8%). One-parent families accounted for 16.9% of all families in the area.

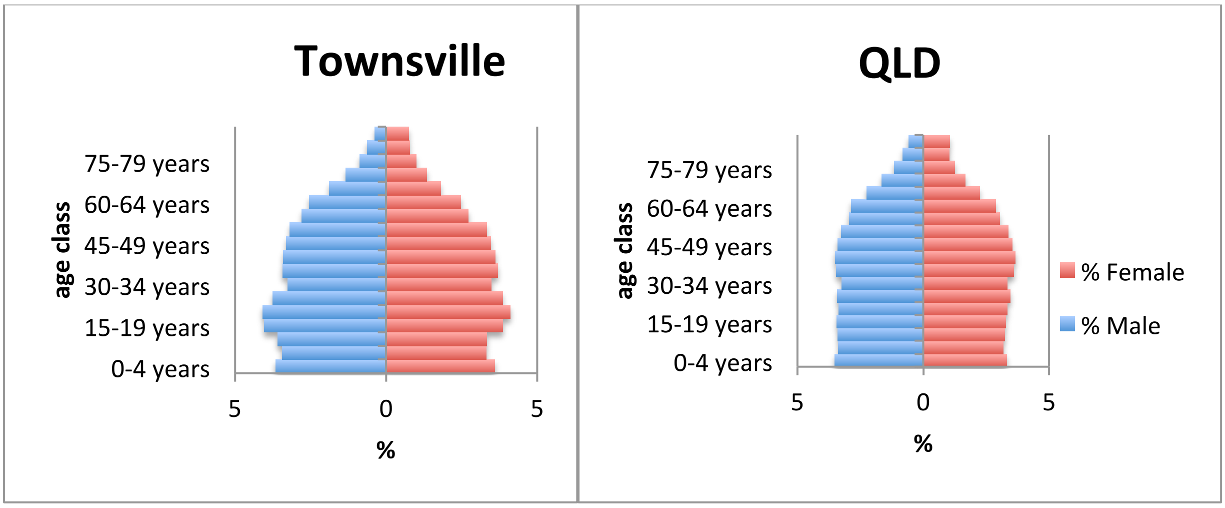

Figure 4: Age profile of Townsville and QLD (2011) (Source: ABS, 2012)

Population diversity

At the time of the 2011 Census, Townsville had 10,703 persons who stated they were of Aboriginal or Torres Strait Islander origin. Indigenous persons made up 6.1% of the total population (compared with 3.6% for Queensland as a whole). Townsville is an important service hub for residents of the Aboriginal community of Palm Island, located 57 kilometres off the coast of Townsville, and serviced several times a week by ferries from the city.

At the time of the 2011 Census, Townsville had 23,181 persons who stated they were born overseas (13.5% of the total population). This is relatively low compared to the proportion of the total Queensland population that was born overseas (20.5%).

Table 3: Context indicator – population (Source: ABS, 2012)

	Townsville 2011	North Queensland 2011	QLD 2011
Population (persons)	176,752	221,757	4,392,099
Indigenous	6.2%	7.1%	3.6%
Overseas born from predominantly English speaking countries	7.8%	6.4%	11.0%
Overseas born from non-English speaking countries	7.4%	5.8%	9.5%
Total overseas born	13.5%	12.4%	20.5%

Table 4: Context indicator – culture and migration (Source: ABS, 2007 & 2012)

	Townsville 2001	Townsville 2011	North Queensland 2011	QLD 2011
% Born overseas	11.7%	13.5%	12.4%	20.5%
% Do not speak English well	0.5%	0.7%	0.7%	1.4%
Indigenous	5.2%	6.2%	7.1%	3.6%

Economic characteristics

Townsville has a strong regional economy, with an estimated gross regional product (GRP) of $9.8 billion in 2008/09. Recent economic performance has been strong, with Townsville's economy growing by 10.6% on average per annum between 2005/06 and 2008/09 which was approximately 2.0 percentage points higher per annum then Queensland's growth rate (Townsville City Council, 2010b). This economic growth is seen to be the result of 'strong population growth, major public sector investment, connection to the minerals industry in Northwest Queensland and Townsville's role as the public and private sector service centre of North Queensland' (Townsville City Council, 2010b). The region appears to be experiencing ongoing growth in investment, with a reported $50 billion worth of projects currently in the development pipeline at June 2012 (Townsville Enterprise, 2012b).

The strength of Townsville's economy is widely acknowledged to be at least partly attributable to its unusual diversity, as no one sector contributes more than 13 per cent of total output (Townsville City Council, 2010b). Significant industries contributing to the Townsville economy include retail trade, health and education services, government administration and defence, construction, mining, manufacturing, and property and business services.

The main employment providers in Townsville[2] are public administration (12.6%), wholesale trade (11.0%), health care and social assistance (10.9%), construction (9.9%), manufacturing (8.2%) and education and training (8.0%) (Townsville Futures Plan Taskforce, 2011: 10). The Australian Defence Organisation located at Lavarack Barracks employs over 6,000, and Townsville is home to many more defence personnel family members.

The economy of Townsville has strong links to the wider regional economy. Townsville is surrounded by two major mining regions, the North West Carpentaria and North East minerals provinces. Three major minerals processing plants operate within the Townsville region, and the city has strong links to Mt Isa and the mining industry of North West Queensland, including its use as a base for a large number of fly-in fly-out (FIFO) workers employed in those areas. The city has long played an important role as an industrial port, and the Port of Townsville remains an important feature in the local and regional economy. As Queensland's third-largest multi-cargo port, it services both the sugar and minerals industries (among others) in North Queensland, and in 2010–2011 handled more than $6.2 billion worth of international exports (Townsville Enterprise, 2012a: 9). It is expected to post a record for 2011/12 as a result of increased quantities of general cargo and consistent volumes of core port commodities. Exports are expected to continue growing as a result of increased magnetite exports and greater export volumes of zinc ferrite and refined zinc (Townsville Enterprise, 2012c: 1).

The 2006 census showed Townsville residents have the highest average income and the highest disposable incomes of Australia's 20 largest urban centres outside the state or territory capitals (KPMG, 2010: 20-21). While the availability of high paying jobs is a positive for employees in the region, there is some evidence it can also cause problems in other sectors. For example, the challenge of retaining workers in the low-paid child care sector, when so many are leaving for better paying work in other industries, was raised at a recent Queensland Council of Social Service (QCOSS) Townsville forum (QCOSS, 2011).

Planning and governance

Influence of the Queensland State Government

The state government is responsible for high-level strategic planning, development and conservation across Queensland, as well as plans with a regional focus. The *Sustainable Planning Act 2009* (Qld) sets out the land use planning laws.

Following the change of government in 2012 the state government approach to planning is in a degree of flux.[3]

The previous state government established the Townsville Futures Plan Taskforce, which, in partnership with Townsville City Council, Growth Management Queensland and the Department of Employment, Economic Development and Innovation, produced the *Townsville Futures Plan* (Townsville Futures Plan Taskforce, 2011). The plan had an economic development focus, and aimed to position Townsville as 'a second capital for Queensland'. Strategies to achieve well-planned and managed population growth were a key focus of the plan, which includes a number of suggested 'catalyst actions' that could

[2] These employment figures refer to ABS 2006 census data for Townsville City LGA. While this census was conducted prior to the local government amalgamation, figures for the new Townsville LGA have been obtained by combining data for previous Townsville and Thuringowa LGAs.
[3] For this reason, the information provided in this section is likely to change in the near future.

'turbocharge' growth in the city.[4] However, following the change of government in 2012, this plan will be superseded.

In 2010, the former government also held a growth management summit to explore the challenges and opportunities of population growth across the state (Queensland Government, 2010a). Priorities identified at the summit included: protecting green space, inter-urban breaks and protecting agricultural land from development, opening green space for recreation, making homes more sustainable and enabling more compact or consolidated development (Queensland Government, 2010b). These priorities were to be implemented by the then Department of Infrastructure and Planning. A new Urban Land Development Authority (ULDA) was also established in 2010 to fast track development and manage the master planning process in areas identified as suitable for population growth (Queensland Government, 2010c).

The status of these priorities is now not clear. The new Queensland Government plans to integrate the ULDA into the new Department of State Development, Infrastructure and Planning, and to transfer some state planning powers from the ULDA to local governments 'to better empower them to plan for their communities'.[5]

While the new government's vision for the Department of State Development, Infrastructure and Planning is 'to drive the economic development of Queensland', further detail of its proposed approach to planning, and to regional planning in particular, is not available at the time of writing, as the department is currently developing a new *Strategic Plan 2012–2016.* However, the new department's stated key strategies[6] are to:

1. Champion the interests of business and industry in Queensland and remove regulatory bottlenecks and impediments to investment.
2. Fast track the delivery of major resource and industrial development projects.
3. Seek opportunities to expand on the economies of the state and the regions thereby enhancing access to global supply chains.
4. Streamline planning, assessment and approval processes to allow the property and construction industries to grow and flourish.
5. Re-empower local governments and their communities to plan for their futures.

Influence of local government

Local councils in Queensland develop land use planning schemes and local planning policies, in line with state planning legislation and regional plans. Local government planning schemes describe a council's long-term plans for the future direction of their local government area.

The current City of Townsville was formed in 2008, when the former councils of Townsville and Thuringowa were amalgamated.[7] The new Townsville City Council is currently preparing a new single

[4] These include decentralisation of government departments and services, the NBN rollout, development of convention and entertainment facilities, revitalisation of the CBD, development of the Townsville State Development Area, growth and management of Townsville as a North Queensland 'strategic defence hub', consolidation and growth of the Douglas Knowledge precinct linking James Cook University with the hospital and other Queensland Health facilities (2010: 26-7).

[5] Department of State Development, Infrastructure and Planning, viewed 1 November 2012, (http://www.dsdip.qld.gov.au/local-area-planning/).

[6] As stated on the website of the Department of State Development, Infrastructure and Planning, viewed 16 October 2012 (http://www.dsdip.qld.gov.au/our-department/our-strategies.html).

[7] The amalgamation also saw the formerly separate water supply entity (then known as NQ Water) amalgamated as part of the new council. Water services are now part of a business unit within the new City of Townsville Council.

planning scheme to replace the previous separate schemes.[8] This will include a plan for priority infrastructure.[9] The new planning scheme will also reflect the introduction of the *Sustainable Planning Act 2009* (Qld) and the Queensland Planning Provisions.[10]

In addition to developing local planning schemes for its LGA, each Queensland council may also develop plans for specific areas. The *Townsville CBD Masterplan* is an example of such a plan (Townsville City Council, 2010d). The *CBD Masterplan* is a response to the 'exponential growth' of outlying centres which has undermined the primacy of the Townsville CBD and has over time 'impacted on the attractiveness of the CBD as a hub for investment' (Townsville City Council, 2010d: 4). The relatively small number of people living in the CBD has been identified as a barrier to the further growth and development of Townsville, with the urban centre being compared to 'a ghost town after business hours'. It has been suggested that this lack of an inner urban residential population contributes to the high vacancy rate for commercial buildings, which are reported to be 'becoming eye-sores', despite being located in an area that 'should be prime real estate' (Templeton, 2012).

The Townsville City Council *CBD MasterPlan* aims to transform the city centre of Townsville so that it is 'both independently successful and contributes to the overall vitality and sustainability of the north Queensland Region' (Townsville City Council, 2010d). The plan includes a proposal to triple the number of people living in the CBD by 2030, in order to revitalise the city centre. Sustainability is a key principle of the plan, which seeks to make Townsville 'an exemplar of sustainable urban living in the tropics' (Townsville City Council, 2010d: 2). Accordingly, the plan to revitalise the city centre is underpinned by the principles of 'a compact urban form maximising efficiencies in transport, energy, land use and infrastructure' (Townsville City Council, 2010d: 13). It is these principles that guide the proposal to concentrate future development in the city centre to 'avoid dilution of activity' and create 'a thriving city heart' (Townsville City Council, 2010d: 10).

While Council's latest residential land use study suggested population growth could be absorbed by greenfield 78% and infill 22%, the *CBD Masterplan* suggests that the CBD has a greater capacity for infill residential development and should rightly be the focus of increased residential density. Intensifying residential development in the CBD in order to increase residential density is proposed as a means of reinstating the primacy of the CBD, and the plan notes that this will potentially require the placing of 'limitations on expansion potential for outlying centres' (Townsville City Council, 2010d: 4).

Other relevant institutions

Townsville Enterprise is an organisation representing industry, business and tourism interests in Townsville. The organisation's vision for the area centres on economic and population growth[11] and it produces a range of publications highlighting the potential of Townsville to investors (for example Townsville Enterprise, 2012a, 2012b, 2012c).

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[8] The former local planning scheme for Townsville is the *Townsville City Plan 2025*. See: http://www.townsville.qld.gov.au/business/planning/planningscheme/Pages/cityplan.aspx. Some joint regional planning had been undertaken prior to the amalgamation, with the development of the *Townsville – Thuringowa Strategy Plan* (2000).

[9] See: http://www.townsville.qld.gov.au/business/planning/planningscheme/newscheme/Pages/why.aspx.

[10] See: http://www.dsdip.qld.gov.au/local-area-planning/local-government-planning-schemes.html

[11] See http://townsvilleenterprise.com.au/AboutUs/VisionMission.aspx

Federal government regional planning initiative

Under the federal government's Regional Development Australia (RDA) initiative, a partnership between the three tiers of government, 55 RDA committees across the country have prepared regional plans. The Townsville and North West Queensland RDA is one of 12 in Queensland.

This RDA region covers the 15 local government areas of the Northern and North West Statistical Divisions – an area approximately a quarter of the landmass of Queensland. Townsville plays a significant role in servicing this wider area.

The North West Queensland RDA's *Regional Road Map* (RDA, 2011) describes the region, its attributes, industry and employment base and key advantages. It also sets out the economic, environmental and social vision for the region, articulates the drivers of change, identifies strengths, opportunities and weaknesses and lists priorities for action. The *Road Map* was last updated in August 2011 and is currently under review.

One priority identified by the *Road Map* is the need to develop a strong identity for the region and raise its profile with all levels of government and the private investment sector. With this end in mind the *Road Map* identifies an intention to 'leverage opportunities from the Queensland Government Regionalisation Strategy' in order to develop Townsville as Queensland's second capital (2011: 5).

Environmental, social and economic indicators

The first component of the case study research involved investigating data relating to the themes and indicators presented in the indicator framework. Results across the three sustainability domains specified in the framework (environmental, social and economic) are discussed here, using the indicators as headings. The availability of data at the local level varies greatly across the indicators, and this report therefore draws on the most appropriate data that could be identified to characterise local activity. Where comparative data (for example at the Queensland level) was available and meaningful, this has been included.

The analysis presented shows that population growth is impacting on all three domains. However, in the environmental domain, data limitations mean there are some gaps in the analysis of how population growth is impacting on environmental quality, particularly regarding air and water pollution and the protection of vulnerable and endangered species. However it is clear that population growth has brought with it changes in land use and increased motor vehicle use, both of which have environmental implications.

The social indicators show that Townsville is a relatively advantaged area, but has some areas of socio-economic disadvantage. Educational attainment data is consistent with the relatively advantaged nature of the area, with Townsville having significantly higher rates of bachelor's degree or higher qualifications compared to North Queensland and Queensland as a whole. Similarly, in line with expectations that socio-economic status is correlated with health status, many of the health indicators suggest that people in Townsville have better health outcomes than those in North Queensland and Queensland as a whole. Unemployment is slightly lower than the Australian average, and a full percentage point lower than the Queensland average.

Townsville has a strong and unusually diverse regional economy. Overall household wealth has increased in recent years, although average dwelling prices in different areas show that there is a range of household income and wealth levels within the LGA. Data suggests that Townsville mortgagees suffer lower rates of mortgage stress than those in North Queensland or Queensland as a whole. Rates of rental stress are slightly higher than in the broader North Queensland region, but lower than the state average. Public transport infrastructure is severely lacking in Townsville, a fact that is reflected in journey to work data that shows a heavy reliance on private vehicles, and a rate of public transport use that is lower than that for walking and cycling. The proportion of residents with broadband Internet connections is slightly lower than the regional or state average, but Townsville is one of the first release sites for the federal government's new National Broadband Network (NBN), so this proportion is expected to increase significantly in the near future.

Environmental indicators

Note: The community-based Townsville State of the Environment Report (SoE) 2003 is the main source of relevant environmental data for Townsville (Sustainable Townsville, 2003). However, a lack of funding has prevented the SoE from being updated since 2003. For this reason, caution should be exercised in interpreting the SoE data in the following section as it considerably dated.

Climate and atmosphere

The Townsville SoE report notes that the three main issues relating to atmosphere in Townsville are: climate change, ozone layer depletion and urban air quality. While urban air pollution is probably the most perceptible issue for local residents, climate change and ozone depletion both pose serious risks. Unfortunately however, the 2003 SoE notes that no climate change data is available for Townsville, and this research has not identified another source of such data.

The SoE reports that the available data relating to urban air quality is limited to a small number of report facilities and so does not provide a reliable measure of ambient air quality in general. However, as an indication, Table 5 summarises compliance with monitoring with standards and goals for Ambient Air Quality of one air monitoring station (Pimlico) in Townsville run by the Queensland EPA for 2011.[12]

The one occurrence where the PM_{10}[13] count exceeded standards in 2011 was due to a bushfire and the other occurrences in past years were caused by major dust storms. In all years between 2007 and 2011, Townsville has not had any days of exceedence for nitrogen dioxide (NO_2), ozone (0_3) or sulphur dioxide ($S0_2$). The SoE notes that Townsville's urban air quality is good relative to more heavily populated regions.

Table 5: Natural capital - climate and atmosphere (Source: Queensland EPA, 2008-2012)

	Pimlico air monitoring station				
	2007	**2008**	**2009**	**2010**	**2011**
NO_2	0	0	0	0	0
0_3	0	0	0	0	0
$S0_2$	0	0	0	0	0
PM_{10}	0	1	9	0	1

The Queensland EPA monitors lead levels in Townsville, as it is an area with industrial sources of lead emissions. The EPA reports that there were no exceedences of the National Environment Protection Measure (Air NEPM) air quality standard for lead in Townsville in the 2011 reporting period (Queensland Government, 2011).

Ecosystems and biodiversity

The Townsville LGA is in the distinct bioregions – the Brigalow Belt, the Wet Tropics and the Einasleigh Uplands. Each of these bioregions comprises significantly different dominant vegetation species, with the Brigalow Belt being dominated by eucalypt woodlands and open forests, the Wet Tropics by rainforest, and the Einasleigh Uplands by ironbark woodlands and dry rainforests. This makes the vegetation within the broader context of the Townsville LGA extremely diverse.

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[12] The data indicates the number of days of exceedence for the year, when the AAQ standard or goal for the pollutant was not met.

[13] PM_{10} refers to particles with a diameter of less than 10 micrometres (μg).

These natural habitats support a wide range of flora and fauna including: 53 mammal species; a large number of reptiles and amphibians including land snakes, estuarine crocodiles, and a diverse range of lizard and frog species; and at least 365 bird species. Endangered, vulnerable and rare species are also found, including mahogany gliders, dugong and cassowaries (Townsville City Council, 2010a).

The broad alluvial plains of the Townsville LGA are dominated by an array of different eucalypt woodlands. However, these areas have been highly modified for urban and agricultural use.

The extent of remnant vegetation within the Townsville LGA can be seen in Figure 5. Non-remnant vegetation occurs on cleared/developed land as well as heavily farmed land.

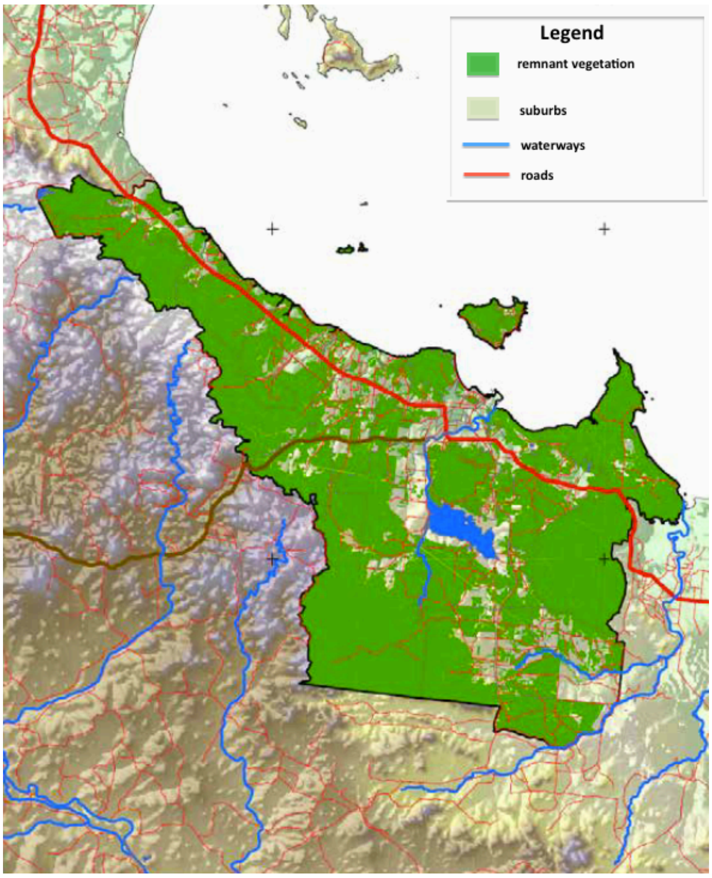

Figure 5: Extent of remnant vegetation in Townsville (Source: C&R Consulting, 2010)

Townsville ranks highly on the biodiversity measures in the Australian Conservation Foundation's *Sustainable cities index*, displaying a high level of habitat connectivity and relatively low landscape stress[14] (Australian Conservation Foundation, 2010: 6).

[14] 'Habitat connectivity' refers to the probability of a species being able to disperse, adapt and breed and therefore increase the biodiversity of the area, while 'landscape stress' describes the quality of the habitat (Australian Conservation Foundation, 2010).

Water

The Australian Conservation Foundation has devised a water consumption measure consisting of measured average residential water supplied per property (as reported by the National Water Commission) relative to mean annual rainfall (as reported by the Australian Bureau of Meteorology). On this measure, Townsville ranks poorly among Australia's twenty largest cities (coming 18th out of 20), with average annual residential water supplied of 397kL/property, compared to a mean annual rainfall of 1141.8mm.

Water consumption data is also available at the individual household level due to Queensland legislation requiring water companies to report the following types of data on residential rates notices:

- graphical and numerical information on water consumption for the current period compared to the previous billing period
- comparisons of average daily water consumption from current billing period to previous year
- the local area residential average for the current period, and
- litres as a unit of measure on a daily comparative basis.[15]

The Townsville City Council Community Report Card (2011) reports that recycled water use has risen to a three-year high, with 14 per cent of all treated effluent being reused.

Land

As stated above, the Townsville LGA is in the convergent zone of three distinct bioregions – the Brigalow Belt, the Wet Tropics and the Einasleigh Uplands. However, due to the extremely large size of the bioregions and the very small area that Townsville LGA covers, data regarding the extent of native vegetation and protected areas at the bioregional level is inappropriate. The Queensland Office of Economic and Statistical Research (OESR) does however report on protected areas at the LGA level. As of 2010, the total park and forest estate in terms of National Parks, State Forests, Timber Reserves and Forest Reserves in the Townsville LGA was 24.8% (925.7 km^2) of the total LGA area (OESR, 2012).

Waste

In Townsville, there are two transfer stations (Toomulla and Bluewater), two landfill and transfer stations (Hervey Range and Jensen) and two landfills (Stuart and Magnetic Island). Little to no data is publicly available regarding waste generation or recycling rates in Townsville. Townsville City Council's Community Report Card (2011) suggests that recycling rates in Townsville are rising, but does not provide any figures.

[15] See http://www.townsville.qld.gov.au/resident/water/Pages/consumption.aspx.

Social indicators

Skills and education

There are a number of ways to assess educational attainment in populations. Common measures are the proportion of the adult population that has a bachelor's degree or higher, and the proportion that has a certificate or diploma qualification. On the former measure (adults with a bachelor's degrees or higher) Townsville has a much higher level of educational attainment than either North Queensland or Queensland. However the data shows that Townsville has a lower proportion of adults with certificate and diploma qualifications compared to the state average, although it is similar to that of the North Queensland region. These results are shown in **Error! Reference source not found.** and **Error! Reference source not found.**.

The proportion of adults with university qualifications in Townsville increased by 5.7 percentage points from 8.4% in 2001 to 14.1% in 2011. This is significantly greater than the increase in the wider population, with university attainment increasing across North Queensland by 8.6 percentage points from 4.06% in 2001 to 12.7% in 2011, and across Queensland from 10.8% in 2001 to 15.9% in 2011. These figures show that the increase in the proportion of the population with university qualifications has been much faster in Townsville than in Queensland as a whole. This may be partly attributable to an influx of highly educated residents, as well as the growth of James Cook University, Queensland's second oldest university, which has its main campus in Townsville, with over 19,000 students. The city is also home to other significant research facilities, including the Australian Institute of Marine Science (AIMS), the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and the Great Barrier Reef Marine Park Authority (GBRMPA).

In terms of certificate and diploma level qualifications, attainment levels in Townsville changed significantly over the ten years between 2001 and 2011, from 14.4% of the adult population in 2001 to 28.0% in 2011. Levels of attainment for these qualifications also grew largely at the North Queensland level (14.6% in 2001 to 27.3% in 2011), and marginally at the Queensland level (21.5% in 2001 to 27.4% in 2011). At the Queensland level, the proportion of the population holding these qualifications is around 6 to 7 percentage points higher than in Townsville.

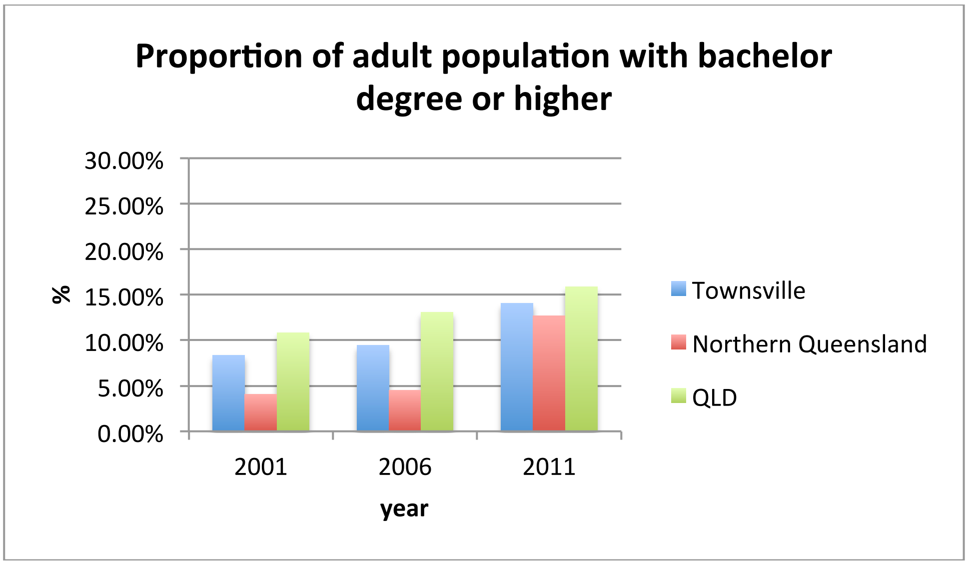

Figure 6: Comparison of adult population with bachelor's degree or higher qualifications (source: ABS, 2012b)

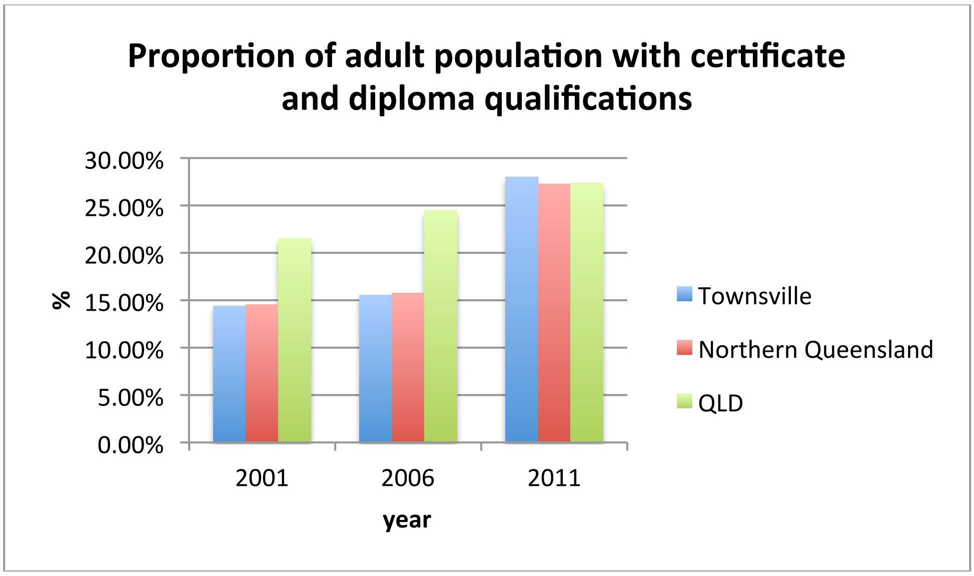

Figure 7: Comparison of adult population with certificate and diploma qualifications (Source: ABS, 2012b)

Health and socio-economic disadvantage

As research on the social determinants of health has shown, health outcomes are closely related to socio-economic status (World Health Organisation, 2012). Using the ABS Socio-economic Indexes for Areas (SEIFA), the Index of Relative Socio-economic Disadvantage (IRSD) scores for Townsville show that the area is less disadvantaged than either North Queensland or Queensland as a whole, but does contain some areas of socio-economic disadvantage. The Townsville LGA was ranked in the ninth decile for disadvantage in Queensland in 2006. However, despite the generally advantaged nature of the area, SEIFA scores do show that there is variability within the LGA, with a minimum census collection district (CD) score of 625 and a maximum of 1161.

Table 6: Social and human capital – disadvantage (Source: ABS, 2008)

	Townsville	Northern Queensland	Queensland
SEIFA Index (IRSD) score	1008	988	1000
Minimum IRSD score of CDs	625	625	439
Maximum IRSD score of CDs	1161	1161	1182
Rank in QLD	133 (of 157 LGAs)		
Rank in Australia	503 (of 667 LGAs)		

While available data sources report health information at the whole-of-LGA level only, it is likely that the health status of the population in Townsville also contains levels of variability similar to those evidenced by the SEIFA scores discussed above. Overall however, the data indicates that Townsville residents enjoy better health than the rest of the state or region. Townsville has a comparatively low proportion of the population who are daily smokers (11.9% in Townsville compared to 19.0% in North Queensland), and a much lower than average percentage of the population rated as experiencing psychological distress[16] or reporting that their health is only 'fair' or 'poor' (see Table 7). The incidence of obesity also appears to be significantly lower in Townsville than in North Queensland and Queensland as a whole (see Table 7). However, as noted above, the aggregation of health data to the LGA level is likely to conceal higher concentrations of poor health status in specific areas of Townsville.

[16] Percentages are of people experiencing high or very high levels of psychological distress on the Kessler 10 scale.

Another health indicator of interest is that used by the Australian Conservation Foundation as part of its *Sustainable cities index*, namely the proportion of the population registered with type 2 diabetes. On this measure Townsville scores highly among Australia's twenty largest cities, with 4.14 per cent of the population registered with type 2 diabetes, a comparatively low rate compared to the other cities in the index (Australian Conservation Foundation, 2010).

Table 7: Social and human capital – health (Source: PHIDU, 2010)

	Townsville 2007	Northern Queensland 2007	Queensland 2007
Proportion reporting fair to poor health	7.5%	12.3%	12.3%
Proportion of adults that are daily smokers	11.9%	19.0%	16.7%
Proportion of adults that are overweight or obese	22.9%	37.1%	36.9%
Proportion of adults rated as psychologically distressed[17]	5.3%	8.3%	9.0%

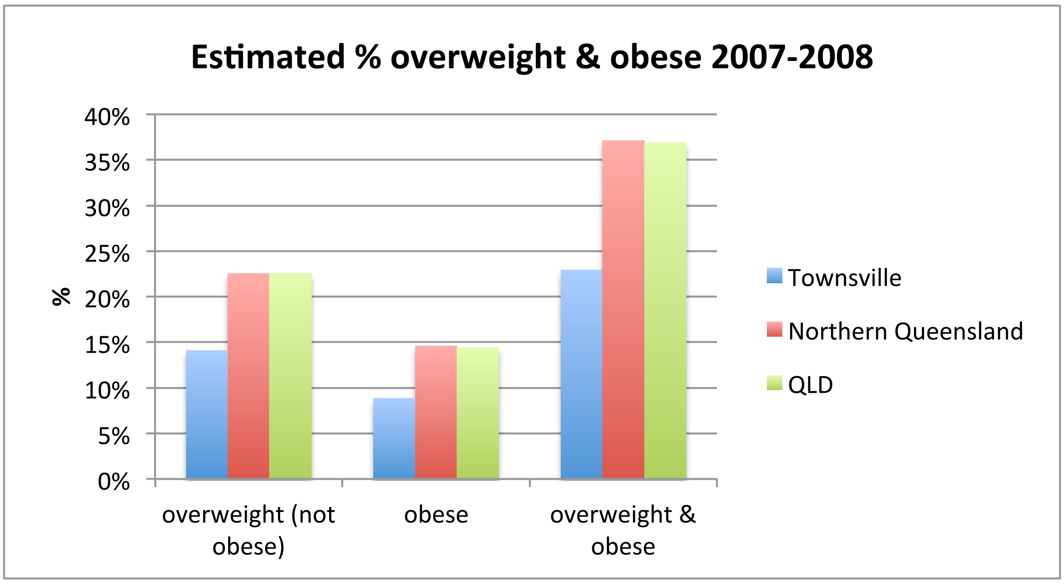

Figure 8: Comparison of estimated % overweight and obese (2007-08) (Source: PHIDU, 2010; ABS, 2009)

Employment and unemployment

For the 2011 Census, the unemployment rate in Townsville was significantly lower than that of Queensland as a whole, and slightly lower than the Australian average. Table 8 below shows how Townsville compares to Queensland and Australia for unemployment and how the DEEWR Townsville North West region compares with the DEEWR Mackay region for hours worked per week and social security take-up.

Table 8: Social and human capital – employment (Source: ABS, 2012; DEEWR, 2012; NIEIR, 2012) (Note: *data for these items is for Townsville North West, which covers the major town centres of Townsville, Ingham and Mt Isa. The Mackay region, which comprises Mackay and Bowen, has been used for comparison,).

	Townsville (2011)	Queensland (2011)	Australia (2011)
Unemployment rate	5.1%	6.1%	5.6%
Participation rate	63.8%	-	65.5%
	Townsville North West	**Mackay**	
Hours worked per week*	26.9 hours (2011)	27.0 hours (2011)	
Social security take-up*	12.7% (2011)	8.6% (2011)	

A more detailed description of the current unemployment figures in Townsville can be found in Table 9. Data indicates that unemployment rates increased across all statistical local areas (SLA) in Townsville between June 2011 and June 2012. The City and South Townsville areas, which had rates of unemployment that were high for the Townsville area (>5%) in June 2011, had larger increases during the year than those with lower rates of unemployment (i.e. Aitkenvale and Kirwan).

Table 9: Social and human capital – employment (Source: DEEWR, 2012b)

Statistical Local Area	Unemployment rate (%) (June 2011)	Unemployment rate (%) (June 2012)	Percentage point change 2011 - 2012
Aitkenvale	3.9%	5.5%	1.6%
City	5.1%	8.1%	3.0%
Kirwan	2.8%	3.9%	1.1%
Pimlico	4.3%	6.6%	2.3%
South Townsville	5.1%	8.0%	2.9%
Stuart-Roseneath	3.6%	5.1%	1.5%

Security and crime

It is difficult to identify local level data on feelings of safety or security. Crime statistics provide some indication of the security or safety of an area, although it is well-documented that caution should be exercised when interpreting crime statistics, not least because they include only *reported* incidents.

The Queensland Office of Economic and Statistical Research (OESR) previously published annual data on reported violent, property and other offences by LGA, but stopped doing so in 2003.[18] While it is now very dated, the OESR data suggests that between 2000 and 2003, Townsville had higher rates of offences against the person, property and other offences than the state as a whole (see Table 10).

[18] Offences against the person include: homicide, serious assault, other assault, sexual offences, armed robbery, unarmed robbery, extortion, and kidnapping. Property offences include: unlawful entry with intent, arson, other property damage, motor vehicle theft, stealing, fraud, handling stolen goods. Other offences include: drug offences, prostitution offences, liquor (exc. drunkenness), good order offences, stock related offences (OESR, 2003).

Table 10: Social and human capital – crime and safety (Source: OESR, 2003)

	Townsville LGA number	Townsville LGA rate[19]	Queensland rate
Offences against the person			
2000-01	960	1,072	866
2001-02	1,205	1,304	1,085
2002-03	1,436	1,555	1,110
Offences against property			
2000-01	10,707	11,959	8,626
2001-02	10,294	11,144	8,094
2002-03	9,249	10,012	7,787
Other offences			
2000-01	3,524	3,936	2,981
2001-02	3,656	3,958	2,866
2002-03	4,307	4,663	3,331

[19] Rates expressed per 100,000 persons.

Economic indicators

Wealth and housing affordability

Standard of living is usually measured by disposable household income, adjusted for household size and controlling for housing costs. In the period between 2001 and 2007 household disposable income across Australia grew on average by 3.1% a year, accelerated to 6.5% per year during the global financial crisis (2008–2009) and in the years since has dropped back to 1.6% (NIEIR, 2012). In the Townsville North West region (which includes Townsville, Ingham and Mt Isa) disposable income grew by 58.1% in the period from 2001 to 2012, which equates to an annualised figure of 5.3% (NIEIR, 2012).

Household wealth can be calculated as the value of dwellings owned by residents, plus holdings in financial assets, less the stock of household liabilities (NIEIR, 2012). As **Error! Reference source not found.** shows, household wealth in the region has increased over the last decade, with most of this increase attributable to increased property values. Household debt service ratios and the ratio of debt to income have also increased. The average house price in Townsville in the 12 months to August 2012 was $355,000 and the average price for a unit was $310,00, although there is variability between suburbs with housing averages of $345,000 in some new greenfield suburbs (Kelso) and $550,000 in older suburbs (North Ward) (Australian Property Monitors, 2012).

Table 11: Economic capital – wealth and housing affordability (Source: NIEIR, 2012) (Note: NIEIR data is for Townsville North West Region, which is larger than the Townsville LGA; *represents growth in chain volume measures using ABS methodology)

	Townsville North West 2001	Townsville North West 2011
Wealth per household*	$320,000	$508,000
Household debt service ratio	13%	16%
Household debt to gross income ratio	1.00	1.27
Average dwelling price	$155,000	$313,000
Average dwelling price to household disposable income	1.8	2.6

Mortgage or rental stress is another useful measure of housing affordability. It measures the proportion of low income households (those in the bottom two percentiles of household income) spending 30% or more of their income on housing costs. In Townsville, 4.7% of low income mortgaged owner-occupiers and 19.7% of low income private renters can be classified as being in mortgage or rental stress. These rates put Townsville below the North Queensland and Queensland levels for mortgage stress, and slightly above North Queensland levels but below the state average for rental stress.

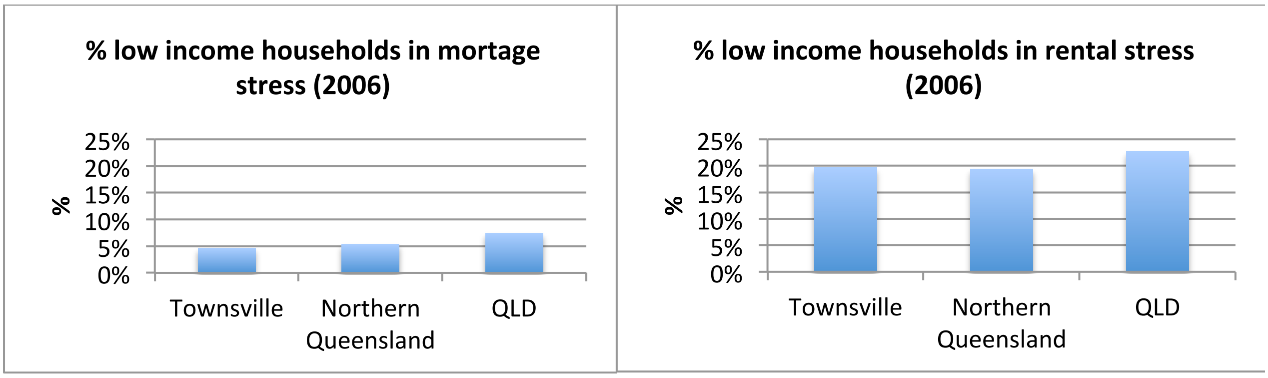

Figure 9: Comparison of % of low income households in mortgage or rental stress (Source: PHIDU, 2010)

Transport and infrastructure

Analysis from the 2011 census on the journey to work patterns of Townsville residents and workers shows that the majority of journeys to work were made in a car as the driver (66.7%), with only 2.1% of people travelling to work by public transport in Townsville. The second-most common method of travelling to work was in a car as a passenger (7.0%), followed by walking (2.9%) and bicycling (1.9%) (ABS, 2012).

Access to broadband Internet connections is a common measure of communications infrastructure. In Australia as a whole, the uptake of broadband services increased rapidly between the 2006 and 2011 census periods. In 2011, 69.1% of Townsville residents had access to a broadband Internet connection, an increase from 39.9% in 2001. This rate of uptake is similar to that in Queensland as a whole (71.3% in 2011) and slightly behind North Queensland (75.9% in 2011) as shown Figure 10.

Townsville is one of the first five release sites in the country for the federal government's new National Broadband Network (NBN), and will be one of the first fully connected provincial cities under this scheme. Approximately 3,000 Townsville residents have already been connected, with others to be included in the second rollout phase (Townsville Enterprise, 2012c: 33).

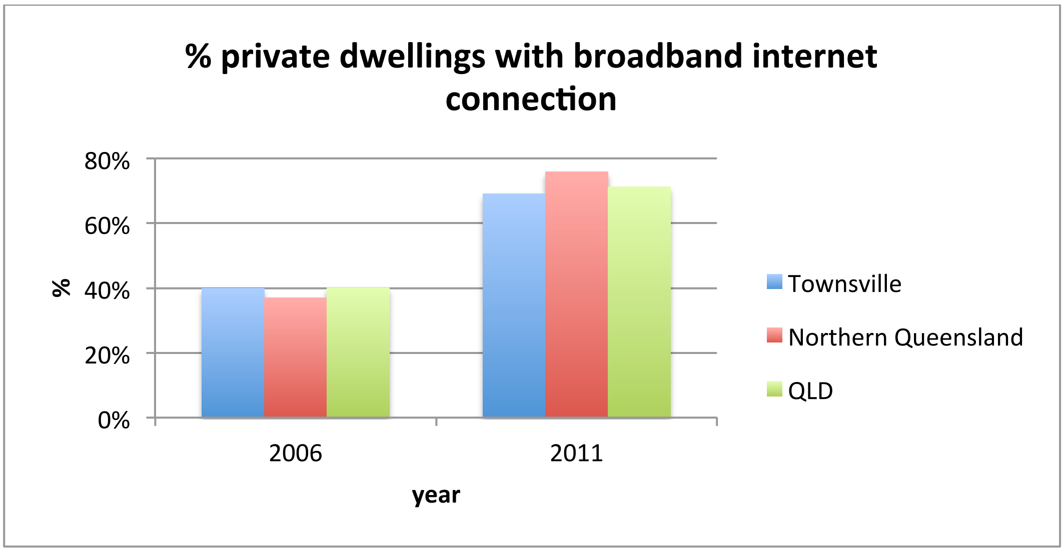

Figure 10: Comparison of broadband internet connection (2006 & 2011) (Source: ABS, 2007 & 2012a)

Productivity

Townsville has a strong regional economy, with an estimated gross regional product (GRP) of $9.8 billion in 2008/09 (Townsville City Council, 2010b).

Townsville is a key part of the diverse regional economy of the larger North Queensland region. According to Townsville Enterprise (2012a) the estimated gross regional product (GRP) of the Townsville region (which includes Townsville and the four much smaller surrounding shire councils) was $13.37 billion in 2010/11. Key contributors to the regional GRP are public administration (including defence) ($2.1b), real estate ($1.4b), manufacturing ($1.3b), mining ($892m) and construction ($834m).

GRP per capita in the Townsville region is $56,303 (2011$). This compares to a gross domestic product (GDP) per capita for Australia of $40,234 (2011$).

Business innovation

Local level business innovation data is virtually non-existent, unless it is collected through small, locally based surveys. Patent counts per population are often used as proxies for innovation, but these are often unsuitable, as patents are only used in certain types of innovation (technology based and radical innovative activity), meaning this measure excludes other more common forms of innovative activity such as service or organisational innovation.

The NIEIR State of the Regions report does calculate patent applications per 100,000 population for the Townsville North West region. NIEIR calculates 16.12 patent applications per 100,000 population (applications between 1994-2011), this compares with the Australian average of 21.01.

Stakeholders

Stakeholders were identified from a process of stakeholder mapping. A total of 23 stakeholders were identified from this process. This initial list was refined and selected stakeholders invited to participate in an interview.

A total of 14 stakeholder interviews were conducted from 8 October to 11 October 2012. The list of stakeholders interviewed is shown below.

Table 12: List of stakeholders

Interviewee	Position and Organisation	Role of organisation	Category
Chris Manning	Acting Executive Manager, Integrated Sustainable Services, Townsville City Council	Council	Environmental
David Lynch	Manager, Economic Development & Strategic Projects, Townsville City Council	Council	Economic
Brian Bailey	Consultant - Technical Advisor, Strategic Planning Unit, Townsville City Council	Consultant	Demographics
Marie-Claude Brown	Executive Officer, Townsville Chamber of Commerce	Local business and industry organisation	Economic
Stephen Motti	Senior Principal of Brazier Motti; Deputy President, Townsville Chamber of Commerce	Local business and industry organisation	Economic
Brian Burkett	Senior Service Officer, Community Recovery, Department of Communities, Child Safety and Disability services	State Government agency	Social
Lorraine Ross	Community Support Officer, Department of Communities, Child Safety and Disability services	State Government agency	Social
Pat Kennedy	Senior Resource Officer, Department of Communities, Child Safety and Disability services	State Government agency	Social
Daniel Staley	Regional Manager Planning, Department of Local Government and Planning Services	State Government agency	Planning
Sandra Harding	Vice Chancellor & President, James Cook University; Member, Townsville Futures Plan Taskforce	University	Economic & Social
Alan Carpenter	Director, Discovery Rise Project, James Cook University	University	
Rosyln Von Senden	Office Manager, Queensland Council of Social Service (Townsville); Team Leader, Indigenous Professional Support Unit	Peak NGO body	Social
Ross Contarino	General Manager, Townsville Enterprise	Local business organisation	Economic
Matt Morris	Economic Development Manager, Townsville Enterprise	Local business and industry organisation	Economic

Positive and negative views about population growth

The various issues relating to population growth that were raised by stakeholders are discussed in detail below. Quotations from the interviews are used throughout the text and are presented in *italics*.

Positive views about population growth

Stakeholders were generally enthusiastic about population growth in Townsville and the positive effects it has had over the last decade. Interviewees spoke of the many *'pull factors'* and '*genuine opportunities'* that have emerged in Townsville because of its position as the *'largest regional hub in Northern Australia'*, and the *'second capital'* of Queensland. One stakeholder spoke of the opportunities to fast track career pursuits, stating:

> *'There are opportunities for career development to happen relatively quickly here in Townsville compared to the other major cities on the east coast'.*

Another interviewee pointed out that Townsville played a particularly important role in providing opportunities for a wide range of people, particularly those in surrounding rural areas.

Recent population growth, and the designation of Townsville as the second capital of Queensland, have not only brought about economic opportunities for new residents, but also social opportunities and benefits, such as '*many more cultural events'.* Many stakeholders spoke of how population growth has contributed to *'maturity in social networks and social support networks'* or what some called '*the intangibles'* that make a place enjoyable to live in. Stakeholders suggested that many new residents were young, educated and from diverse backgrounds and were an important contributor to the changing social fabric of the city. One, for example, stated:

> *'The new people are bringing in new ideas and helping to raise the bar in many ways. They bring different attitudes, different perspectives, and that's good for the city'.*

Another contributor not only to population growth but to the changing social fabric of Townsville has been the growth of James Cook University. Having a major tertiary institution in the area has been a leading factor in attracting people from various backgrounds to Townsville, and for some stakeholders this has drastically influenced the 'feel' of the city and the way it has developed.

> *'Having a university here is really significant – I mean, imagine Townsville without the university. It would be a fundamentally different place. The university brings staff and students from all around the world.'*

Increased health services

Another positive impact of population growth that was raised by stakeholders was the increase in health services, and the capacity for these services to be sustainable because of the increased population base. Some pointed out that without this critical mass of people, the local hospital would not necessarily be able to afford to keep specialists in the area for long periods of time. One stakeholder stated:

> '*If you looked into it, there's probably a bigger range of higher end services here now – like specialist doctors. It's more sustainable for them to be here with more people, and this is a benefit for everybody'.*

Another said *'even brain surgery takes place here now. You don't have to go to Brisbane.'*

Interestingly, stakeholders also suggested that it was not only job opportunities that were attracting new residents to Townsville, but the presence of quality health services. One pointed out that Townsville has the largest hospital in North Queensland, and suggested that '*the medical services are driving a lot of people here'.*

Increased amenity

Townsville has recently undergone a major works program aimed at 'beautifying' the city and increasing amenity, with an important component being the redesign and development of Flinders Street mall. Council has also adopted a 'greening' strategy, taking the decision to increase water use in order to irrigate public open spaces, gardens and roadsides. Many stakeholders pointed to the significance of this 'beautification of Townsville', particularly in *'improving the way people feel about the city'*. Whether these improvements can be considered a direct result of increased population growth is debateable, however, as one stakeholder noted *'the change in the greening of the city has only been possible with the rate base increase.'* In this sense then, population growth has allowed council to undertake projects that might not otherwise have been feasible.

Many stakeholders were in agreement that the roads, footpaths parks and gardens in Townsville were well taken care of and that this level of service was '*probably a result of population growth'.* Interviewees also thought that the improvements to social amenities that have occurred over the last few years were a result of the increased size of the city. Stakeholders believed that Townsville has now reached a level of critical mass which has allowed for higher levels of amenities to flourish in the city, with one stakeholder stating that this *'wouldn't have been possible without growth*'.

> *'Population increase encourages growing amenity and it materially changes the nature of what is on offer – so we are seeing more cafes and restaurants and so on now.'*

One stakeholder suggested it had not only been the increase in population that has driven the improvements in the amenities now found in the city, but also the *'expectations from new people moving in from major southern cities'*.

Regional connectivity

Due to population growth and increased demand, Townsville residents now have increased opportunities and options for direct air travel to parts of the country that previously would have required a stop-over in Brisbane or another large city. This increased connectivity was raised as a positive impact of growth by a number of stakeholders, with one pointing out *'you can even go direct to Darwin now, which you could never could in the past.'*

Negative views about population growth

Interviewees did not generally talk so much about negative impacts of population growth, but rather mentioned a number of issues that needed addressing in order to make Townsville an even more liveable city than it is today. No individual stakeholder viewed population growth in and of itself as negative. There was however a general consensus that the city is seeing the '*cumulative impact of development'* – more people successively impacting the environment than in the past. More specific issues are discussed in more detail below.

Environmental issues

Stakeholders had mixed views regarding the range of environmental issues that are associated with population growth. Many suggested that the citizens of Townsville were fairly environmentally aware and that the city was not really facing any major environmental concerns. However, other interviewees indicated that there were key issues that needed addressing, especially since Townsville is located in close proximity to the middle of the Great Barrier Reef and near the start of the Wet Tropics. As one suggested, because of these environmental characteristics:

> *'There is a higher expectation on us, and we have a higher responsibility to protect these internationally important landscapes'.*

Others expressed a need for Townsville to better understand how growth affects the local environment, with one stakeholder raising the question of *'how to reconcile growth in the area with environmental factors',* especially since '*we are clearly encroaching on the environment*'.

Increased pressure on the marine environment and water infrastructure

Stormwater run-off, which refers to the unnaturally large volumes of run-off created by paving roads and driveways and building structures such as homes and other buildings, can cause flooding, erosion and water pollution. Stakeholders noted that Townsville's recent population boom and consequent increase in non-pervious surfaces has dramatically increased stormwater run-off.

> *'Run-off is an issue. More urban space is changing the natural run-off patterns.'*

Increased run-off places increased pressure on the marine environment and can cause the loss of fish and wildlife habitat and reduced water quality, disturbing whole ecosystems if not kept in check. While only a few stakeholders spoke about the marine environment during interviews, those that did suggested it is a very important issue considering the international significance of the Great Barrier Reef, and Townsville's close proximity to and subsequent role in protecting the reef.

One interviewee pointed to '*infrastructure for water treatment and stormwater treatment'* as one of the '*challenges for Townsville',* as a consequence of population growth, adding that *'there are additional costs put upon Townsville because of this'.*

An increase in run-off is not the only issue affecting the marine environment. An increased population utilising the open water has also put pressure on larger marine life. One stakeholder mentioned that there is anecdotal evidence of '*more pressure on dugongs and turtles because of boat strikes due to the increase in the number of boats'.*

Natural disasters

Townsville is located within a natural disaster-prone, tropical region of Northern Australia. The impacts for residents can be significant, with one stakeholder stating that the Bruce Highway floods several times a year and this drastically affects trade.

> *'Everyone knows there will be no bread or milk for a bit. We can be cut off for five days in a year.'*

Population growth means an increase in the number of residents who do not have experience of the types of natural disasters to which this area is prone, such as cyclones and flooding. Further, the need for increased infrastructure as a result of population growth creates additional potential for infrastructure to be damaged by natural disasters.

Residential and housing design

Stakeholders reported that prior to the 2008 council amalgamation, the current City of Townsville area was influenced by the different agendas of two councils, with one seeking increased residential development and the other pursuing increased commercial development (these governance issues are discussed further in the challenges section below). As a result of this history of the *'two councils competing against each other'*, many stakeholders suggested that much of the residential development which had occurred in Townsville had been inappropriate or poorly planned, with one interviewee characterising it as *'path of least resistance development'.*

One aspect of the poor planning mentioned by many stakeholders was the lack of diversity in suburbs, with little in the way of shops and economic opportunities having been provided in residential areas. However, the topic that nearly every stakeholder raised and was passionate about was the design and size of houses in the newer suburbs of Townsville. Stakeholders were frustrated by the continued increase in housing size, which many saw as contributing to poor environmental outcomes:

> *'The expectations is that families can move right into McMansions. But the large size of these houses increases electricity usage and it also means more non-pervious surfaces, which increases water run-off'.*

Nearly all stakeholders were also critical about the general design of residential buildings that have been constructed in Townsville in recent times, with the predominant housing design for new buildings being *'the standard southern model of concrete slab and brick'*. As one put it:

> *'We get houses built in Townsville that are just not built for the local environment and climate'.*

Many pointed out that these '*inappropriate housing designs*', result in increased environmental impacts and resource usage. Many compared them unfavourably to the typical 'Queenslander' style house that is built on stilts to raise it off the ground, allowing for increased natural ventilation and decreasing the need for the use of air conditioners and therefore delivering far greater levels of energy efficiency.

Social issues

Transport

Public transportation infrastructure and access dominated much of the conversation for stakeholders when discussing social issues. Stakeholders saw public transport as severely lacking in all areas of the city and felt that levels of provision had clearly not kept up with population growth. Many felt that poorly planned and coordinated residential development, combined with these public transport deficiencies, has produced a highly car dependent city characterised by '*quintessential urban sprawl*'. As various stakeholders stated:

> *'People in Townsville are very dependent on their cars, and there really is no public transport to speak of because of the urban sprawl of the area.'*

> *'The model of settlement is not the best. We have ended up with a big sprawl requiring major freeways to connect people, and high levels of private car usage, which is almost impossible to service with infrastructure.'*

> *'We have poor public transport because there isn't the density. We are still very car dependent. We won't get good public transport until there is that driver for people to get onto the bus, but that means we will begin to get bad congestion.'*

Stakeholders suggested that if Townsville wants to keep its '*country town feel*', then it will need a more integrated transport system which connects different parts of the city and reduces traffic congestion and car use. However, stakeholders noted something of a 'Catch-22' situation, suggesting that because public transport has not grown at the same pace as the city's population, many people have now become reliant on cars so there is not the critical demand for public transport which would make it viable to build, operate and sustain. One stakeholder noted that:

> *'Infrastructure costs are starting to be a problem.* [Townsville] *has very high rates for a local government, to enable us to try and keep up with infrastructure costs'.*

This stakeholder also wondered about the public's willingness to continue to pay higher rates, noting that '*rates aren't formally capped in Queensland, but they are capped politically'.*

The high infrastructure costs also make for high costs for those who do need to use public transport and some suggested it can be prohibitively expensive for some members of society:

> *'The cost to get from Upper Ross is about four to five dollars, which is a lot if you are on a pension or benefits. Public transport is an issue for everyone.'*

It was also suggested that an inability to afford public transport *'can lead to isolation for some people',* particularly those from a lower socio-economic background.

While some stakeholders pointed to people who cannot afford to access public transport, others pointed to the challenge in persuading car owners to change their travel habits even if public transport were improved:

> *'The challenge is changing people's perceptions. The car is king. No matter what you do you can't seem to get people out of their cars. This is starting to build up congestion.'*

Many stakeholders suggested that because of the current lack of public transport, there is little incentive for Townsville residents to even try to catch a bus. As one put it *'for most people it is much easier to get in the car'.*

One stakeholder suggested that for short trips walking or cycling was more feasible than public transport and suggested that active transport is the second-most common form of transport after private car usage[20], indicating that public transport is severely lacking in Townsville.

Some stakeholders suggested that with an increasing population base and a strategic growth focus there should be potential to begin delivering transport infrastructure to the area that is useable and acceptable to the public. One stakeholder believed that Townsville is reaching *'a tipping point'* for transport and that '*there is a risk if we don't tackle it now – then where are we going to be in the next five years? We are at a critical point for getting that infrastructure right.'*

As many stakeholders repeated, ideally transport infrastructure should be planned and provided before population growth, so that people can begin using it immediately rather than establishing a pattern of car dependence.

> *'It's key to get the transport arrangements to precede the population changes.'*

[20] This is confirmed by ABS 2011 travel to work data which shows only 2.1 per cent of Townsville residents travelled to work by public transport, compared to 4.8 per cent who walked or cycled.

Others acknowledged, however, that delivering transport infrastructure ahead of population growth was challenging, and that there were always difficult questions about how this infrastructure should be funded:

> *'We do have to provide infrastructure before the growth, but someone has to foot the bill.'*
>
> *'High growth areas are going to need to carry more debt, because they have to keep up with increased infrastructure needs. But there is often political outrage about having high levels of debt. And some people raise the issue of intergenerational equity – is it right that the present population pays for infrastructure that will be used by future generations?'*

Another pointed out that previous public transport infrastructure had actually been removed – suggesting a legacy of poor transport planning in the area:

> *'I can't believe they haven't kept up with transport infrastructure development given the level of population growth here. And ironically there used to be a light rail from the Burdekin to Townsville, and Ingham to Townsville – but they got rid of it in 1980s. And now we have really seen traffic increase.'*

Housing

Stakeholders provided a mix views regarding housing in Townsville. Some felt that Townsville was a very affordable place to live, especially in comparison to other major cities in Australia. This relative affordability was seen by some as one of the major factors that was drawing people to the area. However, some stakeholders felt that with an increase in population, there has also been an increase in rental prices, meaning that housing affordability had decreased in recent years.

> *'Housing affordability and rental increases are a real issue. Private rental costs have seen a significant increase. There is a lot of pressure on renters.'*

Stakeholders also suggested that new housing developments have tended to deliver a uniform type of housing that is aimed at one particular type of resident. Some interviewees raised concerns that this creates *'a monocultural community'* and a lack of cultural and social diversity, with one stating that:

> *'If you build one kind of housing then you get a sense of sameness in the communities in all these places. What we need is a greater diversity in housing all around Townsville'.*

Others however pointed to the small number of high density residential buildings that have recently begun to appear in the CBD, suggesting that these were well suited to the Townsville residential market. As previously noted, Townsville has a high turnover of people of working age, and has long seen people relocating to the city for short periods, for example to work with defence or in the mining industry. A number of stakeholders commented that this was a familiar pattern that Townsville residents and employers were comfortable with. In this context, one interviewee suggested that these transient residents find that:

> '*Apartments suit their lifestyle, because they might be coming and going quite often if they are FIFO workers, or they might just be here for a few years, and I think when they're home they don't want to be spending their time mowing the lawn or maintaining a large house in the suburbs.'*

Some felt that this phenomenon was an indication of further potential to deliver a greater diversity of housing options.

Public housing was also raised as an issue for some residents in Townsville. Some stakeholders suggested there is a significant shortage of public housing, and described instances in which this shortage had meant housing commission tenants had been forced to move from one area to another much further out of the city, a location that potentially increased their sense of isolation, and made accessing city-based services more difficult.

Uneven patterns of housing occupation

A number of comments from stakeholders suggest that patterns of housing occupation are becoming uneven and that this may be contributing to a number of challenges for the city. Some stakeholders pointed to what they thought was *'a large ageing-in-place population'* located in the middle ring suburbs of the city, suggesting that this created an uneven pattern of settlement.

> *'The western suburbs where new housing is going in have overpopulation issues, but those older middle suburbs that were built by baby boomers – they are really now under-populated.'*

It was suggested that the large numbers of ageing people living in single or couple households in relatively large houses in these middle suburbs may be contributing both to the expansion of new housing in outer suburbs and an under-utilisation of services in the middle suburbs.

Social isolation

Some stakeholders felt that as Townsville had increased in size, problems of social isolation had begun to emerge in some areas, and there was a need for more social services to help address these issues:

> *'The social service network hasn't kept up with population changes. In the northern beaches and Alligator Creek, there are little or no services. Transport services are really non-existent. So they have become quite isolated communities. Most of the funded services in Townsville are based in the CBD, and they don't really have enough funding to run outreach services.'*

> *'In the last ten years I think we have seen an increase in that isolation factor. Townsville has really gone from a country town to a regional centre. Now there's that city focus – apartments, high rises. More people are living in one bedroom houses or apartments. That means people can become isolated because they no longer have that sense of neighbourhood inclusion. It's a real change in lifestyle.'*

Issues for Indigenous people

Some stakeholders suggested that population growth and associated issues had particular implications for Indigenous people.

With population growth comes land use change and one stakeholder suggested that some of the Indigenous traditional owners would feel the pressure of new development as land around the city is sought after more and more. One example is the access corridor being considered for the port on the eastern side of the Ross River. This stakeholder suggested that the land that is to be considered for the transport corridor is one of the largest Indigenous burial grounds in the area, and inferred that consultation had been limited.

One stakeholder pointed out that a recognition of the environmental impacts of increased development had unfortunate flow-on effects for Indigenous people. The example provided was that increased concern about the impact of development and population growth on marine life had led to wildlife protection measures, which included *'new pressures on Indigenous people not to hunt dugongs or turtles – but those kinds of things are part of their traditional practices'.*

Another suggested that many Indigenous households in Townsville were overcrowded. It was suggested that as Townsville has become more of a hub for Indigenous communities in the larger region, many people have begun to move to the city to connect with family or to access employment or health or education services. It was suggested that once they arrive many find it difficult to find affordable housing:

> *'When people move here it isn't necessarily affordable. Some people have family here, so they move in with them, but that sometimes causes overcrowding'.*

Some stakeholders pointed to *'a high degree of transiency among the Indigenous population'*, with many coming to Townsville temporarily to access health or social services, or because they needed to leave their home community temporarily for a range of reasons. Some were concerned that this group did not always have access to appropriate accommodation in Townsville or were at risk of homelessness. One noted that in general, disadvantage in Townsville is *'concentrated among the Indigenous population'.*

Economic issues

As previously mentioned, Townsville is widely recognised for its diversified economy, and many stakeholders believed this had been the key to having missed out on the worst of the global financial crisis (GFC) and other historic economic downturns. As one stakeholder put it, '*Townsville has always had booms and busts – but economic diversity has always prevented too big of a bust'.*

Generally, stakeholders were very positive about the connection between population growth and economic issues. For many, the strong and diversified local economy was a reason for great optimism about the future of the city, and increased population growth was generally seen as something that would only help to further boost the local economy.

Work and employment

A number of stakeholders pointed to the current mining boom as a factor currently attracting large numbers of working age people to the area. This was seen as contributing to economic as well as population growth as new arrivals increase demand for housing and local goods and services. However one stakeholder did suggest that this had not always been a smooth transition for people, as some new arrivals had underestimated the skills they would need to find employment in the area:

> '*The mining boom has brought a lot of people here, but some people just come up thinking there are lots of jobs and employment will be easy – but they don't realise that they might not have the skills that we need, and so some of them can't actually find a job.'*

Importance of regional connections

Many stakeholders stressed the importance of regional connections as a key contributor to the strength of Townsville's economy, with one for example stating:

> *'We have many important relationships with the various surrounding areas. I think in Townsville, there is a higher understanding of the importance of these regional relationships to our economy. Ask any car dealership here: when sugar prices drop, car sales drop. There are so many links to the agricultural and mining industries, and lots of the jobs in our economy are around Townsville not just in Townsville.'*

Another said that the city's transport links to other parts of the region *'make people aware of the viability of Townsville as a place to do business.'*

Maintaining and promoting these regional links will be an important challenge for Townsville as the city itself continues to grow. One stakeholder suggested that this challenge is well acknowledged:

> '*People in Townsville understand that the town cannot plan its future in an insular way'.*

Challenges and issues of population growth in Townsville

A number of issues or challenges emerged from the stakeholder interviews and analysis of documents undertaken for this case study, including:

- a lack of coordinated planning and governance of past development and growth
- maintaining the feel of a regional town
- responding to the needs of a relatively transient population
- how to maintain a diversified economy
- how to achieve sustainable population growth
- a severe lack of public transport.

Conflicting agendas and lack of strategic, regional planning

Stakeholders pointed out that until relatively recently, the development of the Townsville area was in the hands of two competing local councils which '*didn't really have a strategic planning focus*'. A few stakeholders believed that Townsville is still suffering from this lack of coordinated growth and development, with one suggesting *'we are still in the wake of that past approach'*.

Many interviewees stated that the main challenge that population growth has brought to the area, namely urban sprawl, was a result of inadequate planning in the past.

> '*Before with the two councils doing their own thing, the result was very much sprawl.'*

As has been the case in many jurisdictions across Australia, amalgamation of the two councils has brought about institutional and governance change, and a new capacity for a more regional approach to planning. Council is now working on a new planning scheme for the area, which stakeholders feel is key to combating the issues that population growth can bring. One example given was:

> *'There was limited mixed use development in the past, but the new planning scheme is aiming to bring this back.'*

Stakeholders were generally more optimistic about the future under the new amalgamated councils. As one stakeholder put it, '*the recent amalgamation has brought a single vision for the area and this will help'.*

Regional town feel

For most stakeholders, population growth was recognised as being the catalyst for improved and additional amenities, and it was implied that the community as a whole was grateful for these additions. However, many stakeholders felt that what was attractive about Townsville, both for existing residents and new arrivals, was its regional town feel, and the slower pace of life that it offered. One interviewee suggested that recent community consultations had found very mixed views about the up sides and down sides of growth:

> '*the vast majority of the community are against growth. They want all of the additional amenities that come from population growth, but they don't want the down sides, more traffic congestion, more stress and so on'.*

It appears that an important challenge for Townsville is how to manage the forecast population growth in a way that provides more city-like amenities while maintaining the positive aspects that people associate with smaller towns.

Transient population – retention problem

Townsville has historically had a transient population, something almost all stakeholders acknowledged by pointing to the army's historic role in the city, as well as the development of the mining industry since the 1960s. While many believed a transient population was a positive and '*understood and valued by employers*', some stakeholders viewed this transience as a challenge for Townsville. As one stakeholder said:

> '*Townsville doesn't have an attraction problem, but it does have a retention problem. Many people stay for about five years and then move on because they usually work on contract periods.'*

This suggests that an ongoing challenge for Townsville will be to continue to provide the flexibility that attracts a high number of working age residents to the city for short periods, while also working to encourage more people to establish themselves in the city for longer periods. Increasing the length of time that people stay in Townsville may help to strengthen community relationships and connections.

Maintaining a diversified economy

Some stakeholders believed that Townsville has been able to cater quite well for a transient population because of the aforementioned diversified economy. While the current economy was seen to be strong, and stakeholders felt that Townsville '*hasn't felt the economic downturn*' because of this diversity, they were conscious of the need to maintain a diversified economy into the future.

As one put it, while '*the variety that we have in terms of industries has been purposely developed and that has been fairly natural in the past',* there is an ongoing challenge to '*maintain a balance of enticement for outside investors and livability for residents'.*

One stakeholder related this challenge directly to outsiders' perceptions of Townsville as a country town, suggesting that '*people who come here are often a bit surprised at what it has to offer, and sometimes that's what attracts them to move here'* but that the persistence of the *'outsider view that Townsville is just a small country town'* continues to be '*a bit of a hindrance to getting further investment'.*

Sustainable population growth

One challenge mentioned by stakeholders was how to maintain population growth at manageable and sustainable pace. Some stakeholders suggested that the growth rate that occurred during the last few years before the GFC had been too rapid and difficult to manage and that the recent slight reduction in the rate of growth was positive because it means 't*hings are pretty manageable at the moment'.* One stakeholder stated that:

> '*At less than two per cent growth, it's okay. But above two per cent it's just too much – we couldn't do it for more than two or three years. But at the moment I think we have the capacity to manage this rate of growth'.*

Information gaps and opportunities

Ample data is available in relation to Townsville's economic profile, and very useful anecdotal evidence was collected in relation to some social and environmental issues. However, data gaps remain in relation to some key areas. Stakeholders reported that in the case of the out-dated SoE report, the failure to update this data was due to a lack of funding.

Many of those interviewed expressed interest in the indicators and made suggestions about potential additions to the indicator framework. While these suggestions tended to be at the level of issues to be covered rather than specific indicators or measures that might be used, they included:

- 'resilience to disasters'. It was suggested that this issue cuts across all domains and affects transport, health and the environment. Stakeholders were particularly conscious of this issue because the recent cyclone in the area had brought significant challenges, including insurance problems and potential barriers for investors.
- 'social cohesion'
- indicators relating to cultural issues
- 'a lifestyle indicator – a happiness indicator'.

Some stakeholders suggested that particular indicators could sit in a different domain, or should be conceived of as crossing more than one domain. Others suggested that some indicators that are represented as being within a particular domain (such as climate change, which is currently included in the environmental domain) would be better conceived of as contextual indicators.

Detailed analysis of data availability, gaps and possible alternative measures is provided in Tables 13–16 below.

A summary of theme and indicator data is provided in Tables 17–20.

Table 13: Natural Capital - data availability, gaps and alternative measures

Natural Capital				
Theme	**Indicator**	**Measure**	**Data availability at case study level**	**Alternative case study level measure (if applicable)**
Climate and atmosphere	1. Air quality	Number of days in year that key pollutants exceed national air quality standards	Available	Number days of exceedence for nitrogen dioxide (NO_2), ozone (0_3), sulphur dioxide ($S0_2$) and PM_{10}.
	2. GHG emissions	Net greenhouse gas emissions	Not available	No alternative measure available
		Greenhouse gas emissions per capita	Not available	No alternative measure available
	3. Energy usage	Residential and non-residential electricity use	Not available	No alternative measure available
Ecosystems and biodiversity	4. Terrestrial ecosystems	Extent of native vegetation	Not available	No alternative measure available
		Extent and distribution of protected areas	Available	No alternative measure available
	5. Vulnerable and endangered species	Number of endangered species, population and communities listed under the *EPBC Act*	Not available	No alternative measure available
	6. Reestablishment of local vegetation communities	Number of hectares under restoration by Council and	Not available	No alternative measure available
Water	7. Water consumption and availability	Water consumption (per capita)	Not available	Average residential water supplied per property
		Water availability to meet demand	Not available	No alternative measure available
Land	8. Ground cover	Ground cover	Not available	No alternative measure available
Waste	9. Waste disposed to landfill	Waste disposed to landfill	Not available	No alternative measure available
	10. Recycling rates	Proportion of waste generated being recycled	Not available	No alternative measure available

Table 14: Social and Human Capital - data availability, gaps and alternative measures

Social and Human Capital				
Theme	**Indicator**	**Measure**	**Data availability at case study level**	**Alternative case study level measure (if applicable)**
Skills and education	11. Educational attainment and qualification	Highest level of educational attainment	Available	n/a
	12. Education services	Ratio of childcare places to population of children aged 0-5 years resident in the LGA	Not available	No alternative measure available
		Ratio of primary school places to population of primary aged children resident in the LGA	Not available	No alternative measure available
Health	13. Self-reported health status	% reporting fair to poor health	Available	n/a
	14. Life expectancy	Life expectancy	Not available	No alternative measure available
	15. Persons who smoke daily	% of adults who are daily smokers	Available	n/a
	16. Obese persons	% of adults that are overweight or obese	Available	n/a
	17. Mental health	Proportions of adults rated as psychologically distress	Available	n/a
	18. Access to open space	Open space per capita	Available	n/a
Institutions and governance	19. Fair and functioning institutions and governance	Levels of trust in key institutions	Not available	No alternative measure available
	20. Community engagement	Proportion of people who volunteer	Available	n/a
Employment	21. Under-employment	Underemployment rate	Not available	Hours worked per week
	22. Unemployment	Unemployment rate	Available	n/a
	23. Local employment	% people working and living in the same LGA	Not available	Participation rate
Security	24. Security	Feelings of safety	Not available	No alternative measure available
		Incidence of personal and household crime	Available	n/a

Table 15: Economic Capital - data availability, gaps and alternative measures

Economic Capital				
Theme	**Indicator**	**Measure**	**Data availability at case study level**	**Alternative case study level measure (if applicable)**
Wealth	25.Household net wealth	Household net worth	Not available	Wealth per household
Housing	26.Housing supply gap	Net dwelling gap	Not available	Average dwelling price
	27.Housing affordability	Low income households in rental stress	Available	n/a
		Low income households in mortgage stress	Available	n/a
Transport and infrastructure	28.Mode of transport to work	Car as driver	Available	n/a
		Car as passenger	Available	n/a
		Public transport	Available	n/a
		Walking	Available	n/a
		Other	Available	Worked at home/did not go to work
	29.Transport infrastructure	Kilometres of dedicated cycling paths	Not available	No alternative measure available
	30.Access to broadband internet	% households with broadband connection	Available	n/a
Income	31.Income disparity	Disparity in disposable household weekly income	Not available	Social security take-up; Household debt service ratio; Household debt to gross
Productivity and	32.Multifactor productivity	Multifactor productivity	Not available	Gross regional product (GRP) per capita
	33.Innovation	Business with innovative activity	Not available	Patent counts per population
Socio-economic status	34.Relative socio-economic disadvantage	ABS Index of Relative Socioeconomic Disadvantage (IRSD) score	Available	n/a

Table 16: Contextual indicators - data availability, gaps and alternative measures

Contextual Indicators				
Theme	**Indicator**	**Measure**	**Data availability at case study level**	**Alternative case study level measure (if applicable)**
Population	35.Population size	Number of persons	Available	n/a
	36.Rate of growth	Annual rate of population growth	Available	n/a
	37.Population density	Number of persons per square kilometre	Available	n/a
	38.Gender and age profile	Gender and age profile	Available	n/a
Land use	39.Land use change	Rates of greenfield development	Not available	No alternative measure available
Cultural diversity	40.Proficiency in spoken English	% do not speak English well or not at all	Available	n/a
	41.Indigenous population	% indigenous	Available	n/a
	42.Country of birth	Country of birth	Available	n/a
Regional migration	43.Net overseas migration	Net overseas migration	Not available	No alternative measure available
	44.Overseas born	% born overseas	Available	n/a
	45.Domestic or internal migration	Net number of regional internal migrants	Available	n/a

Summary of theme and indicator data for Townsville

Table 17: Natural capital - data figures

Natural capital						
Theme	**Indicator**	**Measure**	**Data**	**Frequency**	**Spatial resolution**	**Data source**
Climate and atmosphere	1. Air quality	Number days of exceedence for nitrogen dioxide (NO_2), ozone (0_3), sulphur dioxide ($S0_2$) and PM_{10}.	0 days for nitrogen dioxide (NO_2), ozone (0_3), sulphur dioxide ($S0_2$) between 2007 and 2011. Exceedences for PM_{10} in 2008, 2009 and 2011.	Annual (2007-2011)	Pimlico	Queensland EPA
	2. GHG emissions	Net greenhouse gas emissions	Not available	n/a	n/a	n/a
		Greenhouse gas emissions per capita	Not available	n/a	n/a	n/a
	3. Energy usage	Residential and non-residential electricity	Not available	n/a	n/a	n/a
Ecosystems and biodiversity	4. Terrestrial ecosystems	Extent of native vegetation	24.8% of LGA area	2010	LGA	OESR
		Extent and distribution of protected areas	Not available	n/a	n/a	n/a

	5. Vulnerable and endangered species	Number of endangered species, population and communities listed under the *EPBC Act*	Not available	n/a	n/a	n/a
	6. Reestablishment of local of vegetation communities	Number of hectares under restoration by Council and volunteers	Not available	n/a	n/a	n/a
Water	7. Water consumption	Average residential water supplied per property	397kL/property, 18th out of Australia's twenty largest cities	2010	LGA	Australian Conservation Foundation
		Water availability to meet demand	Not available	n/a	n/a	n/a
Land	8. Ground cover	Ground cover	Not available	n/a	n/a	n/a
Waste	9. Waste disposed to landfill	Waste disposed to landfill	Not available	n/a	n/a	n/a
	10. Recycling rates	Proportion of waste generated being recycled	Not available	n/a	n/a	n/a

Table 18: Social and human capital - data figures

Social and human capital						
Theme	**Indicator**	**Measure**	**Data**	**Frequency**	**Spatial resolution**	**Data source**
Educational attainment	11. Educational attainment and qualification	% adults with tertiary qualifications	8.3% (2001), 14.1% (2011), Increase*	5 years (Census)	LGA	ABS
		% adults with Certificate/ Adv Diploma	14.4% (2001), 14.6% (2011), Increase*	5 years (Census)	LGA	ABS
	12. Education services	Ratio of childcare places to population of children aged 0-5 years resident in the LGA	Not available	n/a	n/a	n/a
		Ratio of primary school places to population of primary aged children resident in the LGA	Not available	n/a	n/a	n/a
Health	13. Self-reported health status	% reporting fair to poor health	7.5% (2007), QLD 12.3% (2007)	2004 & 2007	LGA	PHIDU, compiled from ABS & NHS data
	14. Life expectancy	Life expectancy	Not available	n/a	n/a	n/a
	15. Persons who smoke daily	% of adults who are daily smokers	11.9% (2007), QLD 16.7% (2007)	2004 & 2007	LGA	PHIDU, compiled from ABS & NHS data
	16. Obese persons	% of adults who are overweight or obese	22.9% (2007), QLD 36.9% (2007)	2004 & 2007	LGA	PHIDU, compiled from ABS & NHS data
	17. Mental health	% of adults rated as psychologically distress	5.3% (2007), QLD 9.0% (2007)	2004 & 2007	LGA	PHIDU, compiled from ABS & NHS data

	18. Access to open space	Open space per capita	Not available	n/a	n/a	n/a
Institutions and governance engagement	19. Fair and functioning institutions and governance	Levels of trust in key institutions	Not available	n/a	n/a	n/a
	20. Community engagement	% of volunteering	18.9% (2006), 18.0% (2011), Decrease*	5 years (Census)	LGA	ABS
Employment	21. Underemployment rate	Hours worked per week	26.9 hours (2011), +3.1% change from 2007	Annual	NIEIR region	SoR
	22. Unemployment rate	Unemployment rate	5.1% (2011), QLD 6.15, Aust 5.6% (2011), Increase for 2006*	5 years (Census)	LGA	ABS
	23. Local employment	Participation rate	63.8% (2012), Aust 65.5% (2012)	Monthly	DEEWR labour force region	DEEWR, Labour Force Region
Security	24. Security	Feelings of safety	Not available	n/a	n/a	n/a
		Incidence of reported crime	Offences against the person: 1,555 (2003), QLD 1,110 (2003), Increase* Offences against property: 9,249, QLD 7,787 (2003), Decrease*	Annual (2000-2003)	LGA	OESR

Table 19: Economic capital - data figures

Economic capital						
Theme	**Indicator**	**Measure**	**Data**	**Frequency**	**Spatial resolution**	**Data source**
Wealth	25. Household net wealth	Wealth per household	$320,000 (2001), $508,000 (2011), Increase*	Annual	NIEIR region	SoR
Housing	26. Housing supply gap	Average dwelling price	$155,000 (2001), $313,000 (2011), Increase*	Annual	NIEIR region	SoR
	27. Housing affordability	Low income households in rental stress	19.7% (2006), QLD 22.7.0% (2006)	5 years (Census)	LGA	PHIDU
		Low income households in mortgage stress	4.7% (2006), QLD 7.4% (2006)	5 years (Census)	LGA	PHIDU
Transport and infrastructure	28. Mode of transport to work	Car as driver	66.7% (2011)	5 years (Census)	LGA	ABS
		Car as passenger	7.0% (2011)	5 years (Census)	LGA	ABS
		Public transport	2.1% (2011))	5 years (Census)	LGA	ABS
		Walking	1.9% (2011)	5 years (Census)	LGA	ABS
		Motorbike/scooter	1.5% (2011)	5 years (Census)	LGA	ABS
	29. Transport infrastructure	Kilometres of dedicated cycling	Not available	n/a	n/a	n/a
	30. Access to broadband internet	% households with broadband	39.9% (2006), 69.1% (2011), Increase*	5 years (Census)	LGA	ABS
Income	31. Income disparity	Social security take-up	12.7% (2011), 1.7% points increase from 2007	Annual	NIEIR region	SoR
		Household debt service ratio	13% (2001), 16% (2011), Increase*	Annual	NIEIR region	SoR

		Average dwelling price to household disposable income	1.0 (2001), 1.27 (2011), Increase*	Annual	NIEIR region	SoR
Productivity and innovation	32. Multifactor productivity	GRP per capita	$56,303 (2011), national $40,234 (2011$)	Annual	Townsville region	Townsville Enterprise
	33. Innovation	Patent counts per population	16.12 per 100,000 (1994-2011), national average 21.01	Annual	NIEIR region	SoR
Socio-economic status	34. Relative socio-economic disadvantage	ABS IRSD score	Townsville 1008, Northern Queensland 988, QLD 1000	5 years (Census)	LGA	ABS

Table 20: Contextual indicators - data figures

Contextual Indicators						
Theme	**Indicator**	**Measure**	**Data**	**Frequency**	**Spatial resolution**	**Data source**
Population	35. Population size	Number of persons	144,789 (2001), 180,389 (2011), Increase*	Annual	LGA	ABS
	36. Rate of growth	Annual rate of population growth	Average 2.2% per annum 2001-2011	Annual	LGA	ABS
	37. Population density	Number of persons per square kilometre	38.8 (2001), 48.4 (2011), Increase*	Annual	LGA	ABS
	38. Gender and age profile	Gender and age profile	See Figure 4	5 years	LGA	ABS
Land use	39. Land use change	% infill development	Not available	n/a	n/a	n/a
		% greenfield development	Not available	n/a	n/a	n/a
Cultural diversity	40. Proficiency in spoken English	% do not speak English well or not at all	0.5% (2001), 0.7% (2011), Increase*	5 years	LGA	ABS
	41. Indigenous population	% indigenous	5.2% (2001), 6.2% (2011), Increase*	5 years	LGA	ABS
	42. Country of birth	Country of birth	See Table 21	5 years	LGA	ABS
Regional migration	43. Net overseas migration	Net overseas migration	Not available	n/a	n/a	n/a
	44. Overseas born	% born overseas	11.7% in 2001, 13.5% in 2011	5 years	LGA	ABS
	45. Domestic or internal migration	Net number of regional internal migrants	Data inconclusive[21]	Annual (2006-2010)	SLA	ABS

[21] ABS (cat. no. 3412.0) Migration, Australia, 2010-11 experimental regional internal migration estimates. Data for Townsville inconclusive.

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Appendix A

Table 21: Contextual indicators - country of birth

Country of birth	2001	2011	Percentage point change 2001-2010
Australia	83.1%	80.2%	-2.8%
Bosnia and Herzegovina	0.0%	0.0%	0.0%
Cambodia	0.0%	0.0%	0.0%
Canada	0.2%	0.2%	0.0%
China (excl. SARs and Taiwan)	0.1%	0.2%	0.1%
Croatia	0.0%	0.0%	0.0%
Egypt	0.0%	0.0%	0.0%
Fiji	0.1%	0.1%	0.0%
Former Yugoslav Republic of Macedonia	0.0%	0.0%	0.0%
Germany	0.5%	0.4%	0.0%
Greece	0.1%	0.1%	0.0%
Hong Kong (SAR of China)	0.1%	0.1%	0.0%
India	0.1%	0.5%	0.4%
Indonesia	0.1%	0.1%	0.0%
Iraq	0.0%	0.0%	0.0%
Ireland	0.1%	0.2%	0.0%
Italy	0.3%	0.3%	-0.1%
Japan	0.1%	0.1%	0.0%
Korea, Republic of (South)	0.1%	0.1%	0.0%
Lebanon	0.0%	0.0%	0.0%
Malaysia	0.2%	0.2%	0.0%
Malta	0.0%	0.0%	0.0%
Netherlands	0.3%	0.3%	0.0%
New Zealand	2.1%	2.5%	0.4%
Philippines	0.4%	0.7%	0.3%
Poland	0.1%	0.1%	0.0%
Singapore	0.1%	0.1%	0.0%
South Africa	0.3%	0.5%	0.3%
South Eastern Europe	0.0%	0.0%	0.0%
Sri Lanka	0.1%	0.1%	0.0%
Thailand	0.1%	0.1%	0.1%
Turkey	0.0%	0.0%	0.0%
United Kingdom, Channel Islands and Isle of Man	3.8%	3.6%	-0.2%
United States of America	0.3%	0.3%	0.1%
Vietnam	0.1%	0.1%	0.0%
Born elsewhere	1.9%	2.4%	0.5%
Country of birth not stated	5.3%	6.3%	1.0%